

Classification of the Cribellate spiders and some allied families, with notes on the evolution of the suborder Araneomorpha

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I. Introduction

The classification of spiders has not yet been stabilized, even as far as the main subdivisions of the suborders are concerned. In a quite recent textbook on Arachnida, SAVORY (1964) was obliged to state that an evolutionary classification of spiders was still lacking. According to

him (p. 177), no fewer than sixteen different systems have been presented during the last fifty years, all of them at least partly arbitrary, phenetic ones.

Eight years ago, when I became interested in revisional studies on spiders, the work was

initiated without prejudice concerning the results. It was not even certain that any positive results would be achieved. Fortunately for me, from the very beginning my main interest was in the Cribellates. My work began as a monographic treatment of the largest Cribellate family, or complex of families, Amaurobiidae – Dictynidae.

During the work on Cribellata, it soon became evident that large numbers of representatives of other families would have to be investigated in order to eliminate the errors caused by previous authors having neglected to observe the cribellum and the calamistrum. As all the main adaptive types of spiders are represented in the Cribellate families, a complete analysis would suggest a revision of the bulk of the Araneomorph genera. When a number of obscure cases had been checked, it was obvious that the limitation of Cribellate families has been rather vague, and that there are numerous Ecribellate groups which can be distinguished from some Cribellate spiders only by the absence of a functional cribellum (cf. PETRUNKEVITCH 1923 and 1933).

When a preliminary analysis of most of the characters used in spider taxonomy had been carried out, and when the role of the complicated patterns of convergence had gradually been realized, the evolutionary significance of the cribellum and calamistrum could at last be determined with certainty. At the same time, the course of structural reduction in spiders could be outlined. This led to a more thorough analysis of the phylogenetic relationships between the Cribellate families and their Ecribellate derivatives. Such a work is practically endless, because a huge amount of type material must be investigated in detail and repeatedly compared. Therefore the results obtained are always more or less preliminary, and minor errors can hardly ever be totally avoided.

As recently stated by EHRLICH & HOLM (1962, p. 653), «traditions and force of habit have influenced present-day workers in taxonomy more than they have influenced workers in most other disciplines». This is especially true in arachnology, where most attempts to improve upon the classifications of SIMON and PETRUNKEVITCH have failed on account of an inordinate trust in the authority of their pioneering work.

Although enormous progress has been made in the taxonomy of spiders thanks to the life-work of SIMON, the taxonomic value of different

characters was never correctly interpreted by him, as he evidently lacked knowledge of the genetic mechanisms and principles of general evolution, these not being available in his time. However, the schema of SIMON (1892 a, p. 61) is an excellent artificial classification, and in so far as fundamentally more natural systems have not yet been presented, the preference for his classification, shown by many recent authors, is justified.

PETRUNKEVITCH, a pioneer in his field, made an honorable life work of the study of most other branches of taxonomic arachnology, concentrating on the higher levels of taxonomy. His entirely new schema (PETRUNKEVITCH 1933) was intended to reflect the phylogeny. Unfortunately, he failed, mainly because he neglected the possibility of independent structural reduction. Therefore, his schema remains as an excellent example of horizontal classification.

In my work, the findings of SIMON and PETRUNKEVITCH, together with numerous details derived from different authors who have worked at beta and gamma levels of spider taxonomy (see pp. 277 – 280), constitute the basic analytical material, but the reliability of any information available has not been taken as self-evident, and, whenever possible, any important evidence for the resulting classification has been checked.

As regards external morphology, I have personally investigated representatives of all groups that are here or by recent authors considered families. Besides, representatives of almost all subfamilies of Araneomorph spiders ever described have been investigated, at least cursorily. In addition to the families which are here generically revised, a large number of genera in Zodariidae, Amaurobiidae, and Filistatidae have undergone a preliminary generic revision. However, the chaotic state of the evolutionary taxonomy of spiders, together with difficulties of a technical and economic kind, have made it impossible for me to complete a phylogenetic classification of the whole suborder.

My own anatomical studies have been restricted to the analysis of the tracheal distribution of a number of Cribellate species, and in addition to that given in the summarizing works of PETRUNKEVITCH (1922 b & 1933), information from various papers has been used to study the evolution of the anatomical characters. In this context, only some of the most important are referred to (PURCELL 1910 a & b; MONTGOMERY 1909; MILLOT 1929, 1930 a, 1930 b, 1931 a, 1931

b, 1931 c, 1933 a, 1933 b, and 1935; FAGE 1937; HICKMAN 1939, 1940, 1943, 1944, 1945, 1948, and 1949; ATANASIU-DUMITRESCO 1941 a, 1941 b; MACHADO 1944; FAGE & MACHADO 1950; HOMANN 1950, 1952, 1961 a, 1961 b, and 1966; YOSHIKURA 1954 a; ZAPFE 1955; CROME 1952, 1955 a, 1955 b, and 1957; FORSTER 1958 and 1959; SUOMALAINEN 1964; LEVI, in the press).

The analysis of ontogenetic characters has been based entirely on information acquired from papers by KISHINOYE (1891), JAWOROWSKI (1891, 1892, and 1895), PURCELL (1895, 1910 a), MONTGOMERY (1909), SCHIMKEWITSCH & SCHIMKEWITSCH (1911), GILTAY (1926), HOLM (1940, 1952 and 1954), YOSHIKURA (1954 b, 1955 and 1958), and EHN (1963, 1964).

The principal sources of information concerning the cytological characters have been reviewed by HACKMAN (1948) and SUZUKI (1954), while the data available from ethological characters lies scattered throughout arachnological literature, and most observations have had to be reviewed with reservations. Concerning the North European species, I have myself been able to check many of the observations of NIELSEN (1932), BRISTOWE (1939 – 1941), and GERHARDT (in GERHARDT & KÄSTNER 1938 – 1941), and during my field work much additional information has also been acquired. Thus the European species stand quite separate as far as the ethological characters are concerned. Valuable, although scattered, information about numerous exotic groups has recently been summarized by KASTON (1964, 1965).

Until recent times, most of the specialists in arachnology have concentrated upon the simplest level of taxonomy, the description of new species and genera, while comparative studies based on investigation of type material have been neglected (e.g., SCHENKEL, STRAND, CAPORACCO, ROEWER and MELLO-LEITÃO), and even during this century a considerable proportion of new species have been described without a single figure (SIMON, STRAND and others). Some of the authors have left no type material, and the only reasonable way of treating their species would be to propose all of them as *nomina dubia* (HINGSTON, FRANGANILLO-BALBOA). Cf. also the opinions of LEVI (1963, p. 493) and HUBERT (1965). The material of a scientific expedition has usually been entrusted to a single arachnologist for publication, although it is practically impossible for any one taxonomist, however learned, to have a critical

knowledge of more than 20 000 species. Thus, the more common species have regularly been described at least five to ten times over, especially when there is some variation in the colouration.

The only modern taxonomic revision that has been published up till now is of a single classic family, Theridiidae (LEVI & LEVI 1962). It was preceded and has been followed by numerous excellent specific revisions by H. W. LEVI (a few with collaborators). In addition to this, some minor families have recently been revised (GERTSCH 1958 a, 1958 b and 1958 c; FORSTER 1959, 1964 b; COOKE 1964; BRADY 1964). Thus the vast majority of spider families lack even a preliminary revision, and, in my opinion, this is the most urgent task for spider taxonomists, and the most necessary for the creation of a phylogenetic classification of spiders.

Furthermore, no arachnologist has made a critical analysis of all the morphological characters, applying the principles of modern evolutionary theory, although results of the study of the evolution of single characters have repeatedly been used in the compilation of systems of spiders. Cf. chapter IV.

Under the circumstances described above, it is neither an easy nor an enviable task to try to present a new, decisively improved classification of this order, or even of a restricted part of it. Moreover, enough information has accumulated on alpha level taxonomy for me to claim to have attempted only a totally phylogenetic classification of this group. Indeed, several equally valid classifications can be established on the same phylogeny (SIMPSON 1945 and 1961; MAYR, LINSLEY & USINGER 1953; BOCK 1963). Cf. also the opinion of LUBISCHEW (1963, p. 418). Thus I am well aware that the classification presented here will not be accepted by every one. There are numerous details, in dealing with which I have been obliged to state that the problem remains unsolved, or that the resulting subdivision is rather a matter of opinion. Thus considerably deviating systems will probably be suggested later, with no fundamental differences in their argumentation or in the accuracy of the basic data.

In addition to the enormous increase in our knowledge of genetics and evolutionary theory, improved and parallel methods of taxonomic analysis have been created to help in the solution of phylogenetic and taxonomical problems. The significance of numerical taxonomy has been

repeatedly emphasized, e.g., by MICHENER & SOKAL (1957), EHRLICH & HOLM (1962 & 1963), and SOKAL & SNEATH (1963). It is a useful method, without prejudice as to the results of analysis, but when used as the only method of study its reliability is doubtful because the characters analyzed are, in any case, subjectively chosen. Thus, e.g., any far-advanced case of convergence may profoundly confuse the true phylogenetic relationships. Such a use of numerical taxonomy has also been criticized with good reason by SIMPSON (1961) and especially by KIRIAKOFF (1961 and 1963).

In the present analysis, I have chosen a compromise between traditional taxonomic procedure and that based on principles of numerical taxonomy. Accordingly, the characters of any taxon have been analyzed as such, without prejudice concerning their affinities to the next higher taxon, in which they have more or less generally been included. In particular, the taxonomic value of different characters has not been estimated as a preceding hypothesis, this being in direct contrast to the principles of all previous authors in the field of arachnology. In the synthetic phase of my work, the limitation and definition of the taxa has been based solely on the results of the analysis, whereas most authors, e.g., PETRUNKEVITCH (1923, 1928, 1933, and 1939 b) have almost consistently left the limitation of families unaltered, and then they have mostly preferred a wider definition or simply given a list of deviating genera or groups of them.

My acceptance of the principles of synthetic classification, briefly described above, has resulted in several fundamental changes concerning the contents and limitation of some of the classic families, but these changes are unavoidable, and each is vindicated by evidence from a number of characters. This procedure, by uniting the advantages of both the numerical and the traditional taxonomies, often yields results that are closer to the truth than those that would be achieved by an analysis based on one method only (JAMES 1963). In fact, these principles had already been presented in other terms by HENNIG (1950, 1957), and JAMES (1953), before the period of numerical taxonomy as it is now defined.

The excellent summarizing works of SONDHI (1962, 1963) concerning the actual factors that determine the development of phenotypic patterns have been a great inspiration in the in-

terpretation of the phylogenetic significance of several types of these patterns in spiders.

For practical reasons, the revision has been simultaneously performed at family, generic, specific, and partly even at infraspecific levels, but the present paper tends to be monographic only as regards the revision of families and genera. The revision of species will be continued in cooperation with Dr. V. D. Roth, Portal, Arizona (Ecribellate Amaurobioidea); Dr. R. R. Forster, Dunedin, New Zealand (Australian region), and Dr. W. Shear, Athens, West Virginia (Oecobiidae); Dr. J. Unzicker, Urbana, Illinois, and Dr. Marie Harm, Dessau, German Democratic Republic (Hahniidae), as well as with Dr. R. Leech, Belleville, Ontario (Nearctic Amaurobiidae).

For a quick summary of the specific revisional work up to date, a preliminary list of the species checked by myself in each of the genera treated has been included in this paper.

The principles of the limitation and definition of taxa, a comparative analysis of the phylogenetic value of different characters, and other theoretical problems inherent in the phylogenetic classification of spiders, will be treated in more detail in a later paper by myself, while the preliminary results of these studies have also been taken into account in the compilation of the classification that is presented in this paper.

As there has been no conflict of opinion concerning the limitation of the suborders Theraphosomorpha and Liphistiomorpha, the present study concentrates on the largest suborder of Araneae, viz. Araneomorpha. The fundamental differences of opinion about this suborder have always been due to different interpretations of the mutual relations of Cribellata and Ecribellata. Because of the central position of the Cribellate groups in Araneomorpha, a detailed revision of them is a short cut to a rough classification of the whole suborder.

The taxonomy of the groups treated here in detail has been in a more or less chaotic state up till now, while the limitation of some other large groups, e.g., the superfamily Araneoidea (cf. LEVI & LEVI 1962) and that of some large, classical families such as Salticidae, Lycosidae, and Thomisidae, has been fairly stable since the pioneer work of SIMON (1892 - 1903).

The group Cribellata and almost all its families are classified in different ways in all the main treatises on spider taxonomy (SIMON *op. cit.*, F. DAHL 1905, 1912; PETRUNKEVITCH 1923,

1928, 1933, 1939 a, and 1958; GILTAY 1925; KISHIDA 1930; BERLAND 1932; BRISTOWE 1938; CAPORACCO 1938; GERHARDT & KÄSTNER 1938 – 1941; MELLO-LEITÃO 1941 a, ROEWER 1942 – 1954; and BONNET 1945 – 1961).

The bulk of the genera and species of Cribellate spiders and Agelenids were originally described according to the general schema of SIMON with the emphasis laid on the details of the colouration of the specimens investigated, and with a qualitative declaration about the eye pattern. Because of the general defectiveness and even inaccuracy of at least the older descriptions, I planned to base this revisional work on the investigation of type material. When the types have been primarily lacking, destroyed, or unavailable after repeated inquiries, other authoritatively identified material has been used and compared in detail with the original description.

The extensiveness of the task has forced me to depart sometimes from this method of working. The Neotropic spiders described by MELLO-LEITÃO have caused the most difficult problems. In spite of repeated inquiries made of numerous South American museums, I have been unable to discover how many of his generotypes have been preserved, while those preserved in La Plata have remained unavailable, for it has not been possible for me to visit this continent.

As well as investigating type material, I have always checked the original description in order to eliminate the errors caused by possible confusion of the material, and in order that the treatment of the cases in which the type material consists of more than one species should be consistent. Numerous well-known European species described during the former half of the last century mainly by Walckenaer, Latreille, H. Lucas, C. L. Koch, Blackwall, Hahn, etc., have been revised in the sense of SIMON (1874 – 1937), LOCKET & MILLIDGE (1951 – 1953), and WIEHLE (1953) for the sake of uniformity. However, no neotypes have yet been designated.

Numerous regional revisions of minor groups treated in this paper have been published since the practice of detailed descriptions and the figuring of genital organs became current. They cover the largest percentage of the genera revised here in the Nearctic region (CHAMBERLIN & IVIE 1932, 1933, 1935, 1937, 1940, 1941, 1942 a, 1942 b, and 1947 a; GERTSCH 1934, 1964; MUMA 1946, 1947; CHAMBERLIN 1947, 1948; ROTH 1956 a, 1956 b; CHAMBERLIN & GERTSCH 1958; MUMA & GERTSCH 1964).

From Europe, the papers of M. DAHL (1931, 1937 a, 1937 b), LOCKET & MILLIDGE (1951 – 1953), WIEHLE (1953), KRITSCHER (1966 b), and HARM (1966) are worth mentioning here, while the catalogue of YAGINUMA (1962 a) is the only revisional work on other parts of the Palearctic, but it is furnished neither with descriptions nor with figures of genital organs.

The Neotropical species have been more or less revisionally treated by MELLO-LEITÃO (1936 a, 1936 b, and 1940 b), EXLINE (1950, 1960), SCHIAPPELLI & GERSCHMAN DE PIKELIN (1957, 1958), BÜCHERL, LUCAS & DESSIMONI (1964), and ROTH (1967 a).

Some Australian groups have been studied by HICKMAN (1948), R. MARPLES (1959), B. MARPLES (1962), and FORSTER (1964 a), and a few Ethiopian genera by TUCKER (1920), LAWRENCE (1939, 1952 a), ROEWER (1954 b), and BENOIT (1966).

Our knowledge of the spider fauna of Madagascar and the Oriental region is most deficient, especially as regards the groups revised here.

A large amount of information acquired from the above list of papers and from a vast number of other printed sources has been critically surveyed, but no attempt has been made to refer to all deviating opinions in single cases.

A world-wide revision has been published only on the family Hypochilidae (GERTSCH 1958 b), and it affords excellent data of the species treated, although I find the phylogenetic conclusions of that paper unacceptable.

II. General taxonomic concepts

The results of the theoretical part of the present study will be treated more extensively in a later paper, but a short survey of the principles accepted is presented here in order to facilitate the weighing of the argumentation of the numer-

ous, and sometimes quite radical, changes in the classification of the group treated.

Definition of taxa. – As the aim of this study is the creation of a phylogenetic classification,

the taxa are here defined as monophyletic groupings of the next lower taxon, irrespective of the possible lack of any true keycharacters. Cf. SOKAL & SNEATH [1963 a, p. 13] and also BRISTOWE (1938 p. 295). In the tables of description, this difficulty is eliminated by the use of basic patterns and evolutionary trends in addition to traditional keycharacters.

Limitation of taxa. – The definition of taxa by monophyly restricts their limitation: the classification presented is strictly vertical. In practice, the application of this principle leads to a choice between exceptionally large and exceptionally small units (cf. LEVI & LEVI 1962, p. 4).

The combination of characters of a known arbitrary taxon, that is any taxon above the species level, need not be considered final at any moment. Accordingly, the inclusion of a new species or, more generally, a lower representative, makes a slight change in this combination rather a rule than an exception. On the other hand, as long as arbitrary taxa are arranged in a phenetic system, the combination of characters originally fixed for them can be consistently followed.

In phylogenetically well known groups splitting cannot be avoided, while in the opposite case the lumping procedure is more often practical. However, the limitation of genera as the lowest artificial groupings has been standardized as far as possible. Thus consistency within the order Araneae has been preferred rather than minor obscurity in the argumentation of the phylogeny, although certainly polyphyletic taxa have not been accepted.

I have tried to make the limitation of the exotic genera comparable to that of the Holarctic ones. In the tables of distribution, the poorly-described exotic representatives of Holarctic genera, whose type material has remained unavailable, are omitted.

When the choice between splitting and lumping procedures has been regarded as a matter of opinion, the application of the code of nomenclature has been taken into account before the final choice between taxonomically equal alternatives. Thus the highest possible stability is reached in the groups in which single adaptive

representatives of a rather compact group have long since been chosen as types of subfamilies or even families.

Homology. – In this paper the name of a morphological structure generally refers to homologous structures. For practical reasons the following exceptions have been made.

Eye patterns: the terms anterior and posterior eye row are also used in cases in which more or less eyes are included in the actual row than in the basic pattern of the suborder.

Male palpal structures: the homologies of the bulbal organs other than the apical part of the embolus cannot be traced with certainty between different superfamilies, and sometimes it is not easy to do so even within much smaller groups (cf. LEVI 1961). Accordingly, the terms median apophysis, conductor, tegulum, and subtegulum refer to homologous structures only within a superfamily. The elaborate nomenclature of palpal structures, used, e.g., by GERING (1953) and MERRETT (1963) is not useful in a comparative study between different groups of spiders. In this paper the term conductor is also used for seemingly analogous structures, but then it is preceded by qualifying words.

The modification of palpal tibia, patella, and femur has been considered here to have been brought about by convergent evolution, and the homologies of these structures can be directly compared in restricted groups only.

Hair covering: the reduction of the plumose type of hairs in favour of the simple-serrate type has occurred in different lines of evolution. Thus the homology of these hairs remains uncertain, and the same is true of the calamistral hairs proper in different Cribellate groups.

Intraspecific variation. – Concerning the preliminary notes on the specific revision of some of the best known groups, different forms of intraspecific variation have not generally been discussed here, but the specific synonymies are listed applying the biological (and not morphological) concept of species. Naturally, the patterns of intraspecific variation in all the groups treated here are not even cursorily known, and further data may later necessitate several alterations in the species concept of at least some groups.

III. Alphabetical list of the genera revised

This catalogue includes the results of the generic revision that has been carried out by myself as the basis of the phylogenetic analysis presented in Chapter V. The status of the genera has been determined by detailed analysis of the characters of the generotype according to the type material, or if this has been unavailable, according to the original description and after examination of other authoritatively identified material. The limitation of the genera has been checked by a preliminary survey of the species referred to this genus. However, a specific revision of all the genera concerned is far beyond the scope of this paper, and even practically impossible under prevailing circumstances.

Principles followed in selection of the genera revised. As pointed out in the introduction, it would not have been possible to carry out the revision of the groups concerned without making some changes in the original plan. In order to get at least a general idea of the phylogenetic relations of the Cribellates proper, the number of genera included had to be increased repeatedly during the work. In spite of this, the lack of generic revision of Ctenidae, Miturgidae and Liocranidae makes it impossible to achieve a comprehensive classification of the groups treated.

This alphabetical list includes all the genera that have been described or subsequently listed by any author in the generally accepted Cribellate families Amaurobiidae, Arthrodictynidae, Dictynidae, Dinopidae, Eresidae, Filistidae, Hypochilidae, Oecobiidae, Psechridae, Tengellidae, Uloboridae, or Zoropsidae. Concerning the generally accepted Ecribellate families, representatives of Agelenidae (including also Argyronetidae and Hahniidae) and Uroctidae have been treated in a similar way. This practice shows clearly the great differences of opinion concerning the limitation of Agelenidae.

While representatives of several other Ecribellate families of Amaurobioidea and Lycosoidea have been revised here, they could not, for practical reasons, be listed according to the principle explained above. As their revision is not a final one, no key-tables have been presented for them in chapter V. Thus, representatives of my Ctenidae, Cycloctenidae, Dolomedidae, Liocranidae, Miturgidae, Selenopidae, Toxopi-

dae, and Zoridae have been preliminarily revised here as far as they are known to me. Contrasting to representatives of the first-mentioned families, such genera that have been transferred outside the groups treated have also been omitted from the alphabetical list. Besides, only the type genus has been listed from the large, possible monophyletic family Anyphaenidae. Additional generic synonymes are probable in all of these preliminarily revised families because of the high percentage of genera that are listed as incertae sedis. In most cases, their type material has not been examined and their original description has not been sufficient for a definite placing.

It is possible that some Cribellate species have been described in some more deviating Ecribellate families, and highly probable that some close Ecribellate derivatives of Cribellate Amaurobioidea were originally assigned to a family whose genera have not been revised here. In my opinion, these possible sources of error are of no great significance, and it is clear that practically all Cribellate spiders and Ecribellate close derivatives of Amaurobioid Cribellates have been revised here.

Declarations of genera which remain outside the groups treated here are printed in small type throughout, independent of whether this is a verification of a previously published opinion or a result of the present revision.

The schema of revision. In order to achieve the most concise but unambiguous expression, facts have been presented in a certain order, as is explained below.

1) The name of a genus is printed in boldface, when it is regarded as valid here, but in italics, when it has been invalidated through synonymy, homonymy, or being a nomen nudum or nomen dubium. The taxon subgenus is omitted, although in some cases, in which subgeneric names have been previously used, or in which the synonymization distinctly refers to subgeneric level only, the possible use of this intermediate category has been discussed. However, for the sake of consistency, no new subgeneric names are proposed here.

2) The name of a genus is listed according to the corrected orthography in cases where the original spelling had to be changed according to the rules of nomenclature. The invalid spell-

ings are generally omitted here, as they have been discussed by BONNET (1945–1961).

3) The name of the original author has not been separated by a comma from the year of the original publication. Thus the practice recommended by ICZN (1964, § 22) has been followed, because the use of this comma seems to be unnecessary from the viewpoint of distinctness and simplicity. A citation of a scientific name, generic or binominal, in a sense deviating from that of the original description, has been indicated by a colon between the name of the taxon and the name of the corresponding author.

4) Next, a more detailed reference to the original publication is given, including the number of the first page of the generic description and corresponding figures, when they refer to the generic definition and not to a named species included. In a few cases, in which neither the original description nor the corresponding type material has been available, these facts have been indicated in parentheses. Other possible notes concerning the status of the proposed name are also listed here.

5) After a colon, a corresponding citation of the generotype has been presented, and the manner of designation is especially mentioned only when it has not been done by original designation or monotypy. The name of the generotype is consistently cited in the first combination of the specific name, in spite of various modifications preferred by the original authors of the genera in question. A current reference to the *terra typica* follows the basic citation, and the sex and state of preservation of the type material follow in parentheses. When not otherwise mentioned, the type material has been investigated by myself. Within the same parentheses, a reference to a later description of the allotype is presented with or without notes on the type preservation, and finally comes a list of other material examined for this work. Both these notes are separated from the reference to original type material as well as from each other by a semicolon. Other abbreviations used within these parentheses tend to be self-explanatory.

6) As a rule, only the oldest or otherwise valid senior synonyms of the generotype are presented, provided that they are generally known and listed either by ROEWER (1945–1954) or BONNET (1945–1961). Junior synonyms that are included in the above-mentioned catalogues are consistently not listed here, unless there is some difference of opinion about them. Neither

has it been possible to check all these known synonyms, and the omitting of these lists of synonyms does not mean that they are accepted. However, a vast number of cases have been checked, and the work will be continued in connection with the specific revisions. All new synonyms are listed chronologically, and sometimes notes on the infraspecific variation are added.

After clarification of the status of the generotype, a concise history of the familial and subfamilial affiliations of the genus has been presented. However, when opinions have been largely contradictory, only the original author of a change has usually been cited. There is a more detailed discussion of the relations of the genus to the other members or corresponding group in Chapter V, and only in a few cases has an abrupt change of opinion been cited here. Corresponding principles have been applied to citations concerning major changes in the limitation of genera.

The synonyms and senior as well as junior homonyms of the valid genera are also listed, but in the case of invalid genera, only the valid synonymic name has been mentioned.

After the revision proper of the genus, a survey of its limitation has been presented in small type letters throughout. In some cases, a more or less complete list of new specific synonyms has been included, but for the sake of brevity the detailed references have been omitted. There are all kinds of intermediate cases coming down to a few genera, of which even a preliminary specific revision has hardly been begun.

The latter part of this generic revision concludes with a reference to genera into which some species have been transferred, although they have sometimes been described or listed in the genus treated. No difference is made between direct citations from this list and indirect citations from the catalogues mentioned.

In order to achieve the highest stability of nomenclature, all the names proposed for new genera are here defined as to be artificial combinations of letters. Gender is in most cases unambiguously determined by the binominal combination that is used in this paper. If any suspicion of confusion arises later in some single cases, their gender is feminine.

In fact, most of the names are derived from non-classical mythological names or from approximately corresponding sources, and there are also some patronymics.

List of complete names of museums, referred to in this paper by the name of the corresponding city¹

*Adelaide	South Australian Museum	Australia	*Helsinki	Zoological Museum, University of Helsinki	Finland
*Amsterdam	Zoölogische Museum der Universiteit van Amsterdam	The Netherlands	*Hobart	Department of Zoology, University of Tasmania	Australia
Auckland	Auckland Institute and Museum	New Zealand	*Honolulu	Bernice P. Bishop Museum	U.S.A.
*Basle	Naturhistorisches Museum Basel	Switzerland	Ithaca	Department of Zoology, Cornell University	U.S.A.
*Berlin	Institut für spezielle Zoologie und Zoologisches Museum	German Democratic Republic	La Plata	Museo de La Plata	The Argentine
*Brisbane	Queensland Museum	Australia	Leiden	Rijksmuseum van Natuurlijke Historie	The Netherlands
*Brno	Vysoké školy zemědělské v Brně	Czechoslovakia	Leningrad	Зоологический институт Академии Наук СССР	U.S.S.R.
*Brussels	Institut Royal des Sciences Naturelles de Belgique	Belgium	Liverpool	Liverpool Museum	Great Britain
*Budapest	Termesztudományi Múzeum, Magyar Nemzeti Múzeum	Hungary	*Ljubljana	Prirodoslovni Muzej Slovenije	Yugoslavia
*Buenos Aires	Museo Argentino de Ciencias Naturales «Bernardino Rivadavia»	The Argentine	*London	British Museum (Natural History)	Great Britain
*Calcutta	National Zoological Collections, Zoological Survey of India	India	Lübeck	Naturhistorisches Museum der Hansestadt Lübeck	German Federal Republic
*Cambridge	Museum of Comparative Zoology at Harvard University	U.S.A.	*Lund	Zoologiska Institutionen, Lunds Universitet	Sweden
*Cape Town	South African Museum	Union of South Africa	*Makokou	Mission Biologique au Gabon	Gabon
Caracas	Museo de Biología, Universidad Central de Venezuela	Venezuela	Marseilles	Muséum de Marseille	France
Christchurch	Canterbury Museum	New Zealand	*Melbourne	National Museum of Victoria	Australia
*Copenhagen I	Universitetets Zoologiske Museum, København	Denmark	Moscow	Зоологический институт Академии Наук СССР	U.S.S.R.
Copenhagen II	Mineralogiske og Geologiske Museum, København	Denmark	Munich	Zoologische Sammlung des Bayerischen Staates	German Federal Republic
Curitiba	Instituto de Historia Natural	Brazil	*New York	The American Museum of Natural History	U.S.A.
*Dundo	Companhia de Diamantes de Angola, Museu do Dundo	Angola	Niterói	Instituto Vital Brazil S.A.	Brazil
*Dunedin	Otago Museum	New Zealand	*Osaka I	Faculty of Science of Living, Osaka City University	Japan
*Florence	Istituto Zoologia, Università di Firenze	Italy	*Osaka II	Archaeological Society of East Asia	Japan
*Forlì	Archivio Botanico e Biogeografico Italiano	Italy	*Oslo	Zoologisk Museum, Universitetet i Oslo	Norway
*Frankfurt	Senckenbergische Naturforschende Gesellschaft, Natur-Museum und Forschungs-Institut	German Federal Republic	Ottawa	Canadian National Collection of Insects	Canada
*Funchal	Seminário de N. S ^a da Encarnação	Madeira (Portugal)	*Oulu	Department of Zoology, University of Oulu	Finland
Gdansk	Naturforschende Gesellschaft in Danzig	Poland	*Oxford	Hope Department of Entomology, University Museum	Great Britain
*Geneva	Muséum d'Histoire Naturelle	Switzerland	*Paris	Muséum National d'Histoire Naturelle	France
*Genoa	Museo Civico di Storia Naturale «Giacomo Doria»	Italy	*Pietermaritzburg	Natal Museum	Union of South Africa
*Gothenburg	Naturhistoriska Museet, Göteborg	Sweden	*Portal	Southwestern Research Station, American Museum of Natural History	U.S.A.
Grahamstown	Albany Museum	Union of South Africa	*Pretoria	Transvaal Museum	Union of South Africa
Haarlem	Museum Teyler	The Netherlands	Rio de Janeiro	Universidade do Brasil, Museu Nacional	Brazil
*Hamburg	Zoologisches Staatsinstitut und Zoologisches Museum	German Federal Republic	*San Francisco	California Academy of Sciences	U.S.A.

¹ An asterisk (*) indicates that material from the museum in question has been examined.

*Santiago de Chile	Museo del Centro de Investigaciones Zoológicas	Chile
São Paulo I	Departamento de Zoologia da Secretaria da Agricultura	Brazil
São Paulo II	Instituto Butantan	Brazil
Salt Lake City	Division of Biological Sciences, University of Utah	U.S.A.
Sofia	Museum of Natural History, Bulgarian Academy of Sciences	Bulgaria
*Stockholm	Naturhistoriska Riksmuseet	Sweden
Stuttgart	Staatliches Museum für Naturkunde in Stuttgart	German Federal Republic
*Sydney	Australian Museum	Australia
Taegu	Kyungpook National University	Korea
*Tervuren	Musée Royal de l'Afrique Centrale	Belgium
Tientsin	Museum Hoangho-Peiho	China
Trieste	Museo Civico di Storia Naturale di Trieste	Italy
*Turku	Zoological Museum, University of Turku	Finland
*Uppsala	Zoologiska Institutionen, Uppsala Universitet	Sweden
*Vienna	Naturhistorisches Museum	Austria
*Warsaw	Instytut Zoologiczny, Polska Akademia Nauk	Poland
Washington	United States National Museum	U.S.A.
Wellington	Dominion Museum	New Zealand
*Wiesbaden	Naturwissenschaftliche Sammlung, Städtisches Museum Wiesbaden	German Federal Republic

Acantheis Thorell 1891, K. Sv. Vet. Akad. Handl. 24: 2, 61: *Acanthoctenus variatus* Thor. 1890, Ann. Mus. Civ. Genova 30, 134 from Nias Island, Indonesia (juv. – type probably lost). The change of generotype I propose is in favour of *Acanthoctenus laetus* Thor. 1890, ibid. from Borneo (♂ Genoa; Paris) = *Acantheis tridens* Poc. 1897, Abh. Senckenb. Naturf. Ges. 23: 4, 611 from Borneo (♂ London), n. syn. Originally assigned to Ctenidae, and selected by PETRUNKEVITCH (1928) as the type genus for the subfamily Acantheinae. Listed here in Acanthocteninae.

Most probably *A. variatus*, *A. laetus*, and *Acanthoctenus dimidiatus* Thor. 1890 from Sumatra (♂ Genoa; subad. ♀ Hamburg) are conspecific, but their status cannot be finally proved until after examination of large samples. *A. longiventris* Sim. 1896 (♀ Paris) belongs elsewhere, as does most probably *A. indicus* Gravely 1931 (♀ Calcutta – not seen). Cf. also *Caloctenus*.

Acanthoctenus Keyserling 1876, Verh. Zool. Bot. Ges. Wien 26, 693: *A. spinigerus* Keys. 1876, ibid. Pl. 8: 60 from Central America (♂ London; ♀ described by F. O. PICKARD-CAM-

BRIDGE 1902: London; ♀ Oulu) = *A. dumicola* Sim. 1906, Ann. Soc. Ent. Belg. 50, 289 from Venezuela (♀ Paris), n. syn. Orthography corrected to *spiniger* by SIMON (1892 a). Described in Ctenidae, transferred to Zoropsidae by SIMON (1878), and selected by him (SIMON 1892 a) as the type genus of the subfamily Acanthocteninae. This Zoropsid subfamily was raised into familial rank by F. DAHL (1901 a); this opinion has been supported by most later authors. The genus *Acanthoctenus* is here radically relimited, and listed in Ctenidae: Acanthocteninae. It is rather closely related to the Ecribellate genera *Asthenoctenus* and *Phymatoctenus*. *Paracantho* is a new synonym of this genus.

Among the numerous species that have been assigned to this genus, the generic affiliation of the following species has been confirmed: *A. spinipes* Keys. 1876 (♀ London; ♂ London, Basle & Paris) = *Paracantho* *virginea* Kraus 1955 (♂♀ Frankfurt – not seen), n. syn., *A. plebejus* Sim. 1906 (♀ Paris), *A. gaujoni* Sim. 1906 (♂♀ Paris), *A. obauratus* Sim. 1906 (♀ Paris), and *A. remotus* Chickering 1960 (♀ Cambridge). KRAUS (1955) transferred *Phymatoctenus kollerii* Reim. 1939 (♀ Vienna – not seen) into *Paracantho*, but this species certainly belongs to *Acanthoctenus*, and it may be conspecific with some of the species listed above. The three first-named species are closely related to each other, and possibly partly synonymous with each other. See also *Acantheis*, *Asthenoctenus*, *Leitanoctenus*, *Mesoctenus*, *Nothroctenus* and *Viracucha*. – *A. rubrotaeniatus* M.-Leit. 1947 (♀ Curitiba – not available; det. PL: London) is an Ecribellate representative of Ctenidae: Acantheinae, but its exact position remains obscure.

† **Adamator** Petrunkevitch 1942, Trans. Conn. Acad. Arts Sci. 34, 344: *A. succineus* Petr. 1942, ibid., 345 Pl. 64: 581, 21: 195 – 201 & 25: 231 from Baltic amber of the Oligocene (♀ London – not seen). Described in Zoropsidae, transferred here to Miturgidae: Uliodoninae.

Adonea Simon 1873, Mém. Soc. Sci. Liège, 2. Ser. 5, 157: *A. fimbriata* Sim. 1873, ibid., 158 Pl. 3: 24 – 25 from Algeria (♂ Paris) = *A. capitata* Sim. 1876, Ann. Soc. Ent. France, 5. Ser., 6, Bull., LXXXVI from Tunis (♀ Paris; Berlin, det. PL: Helsinki) = *Storkaniella janiensis* Krat. & Mill., 1940 (see *Storkaniella*), n. syn. Described in Eresidae, included since SIMON (1903 a) in Eresinae. Synonyms *Amathia* Simon 1873, n. syn., and *Storkaniella*, n. syn.

A. variegata Purc. 1904 (♂♀ Cape Town; ♀ Berlin) is a close relative of the generotype, while *A. splendens* Lawr. 1936 (♂ Pretoria), and *A. parva* Tucker 1920 (♂ Cape Town) could be included in this genus, if the definition is considerably widened. *Eresus ruficapillus* C. L. Koch 1846 (♀ no types; Brussels), *E. petagnae* Aud. 1827 (no type, ♀ Paris), and *E. semicanus* Simon 1908 (♂ Paris) could be transferred to this genus in its widest sense.

Aebutina Simon 1892, Hist. Nat. Araign. 1: 1, 221: *A. binotata* Sim. 1892, *ibid.*, 222 from Brazil (♀ Paris). Originally described as the type genus of the subfamily Aebutininae in Uloboridae. Transferred to Dictynidae by PETRUNKEVITCH (1928); this opinion was shared by MILLOT (1933 b) on the basis of anatomical characters. The lack of known males leaves its final position open, but it is most probably neither a representative of Amaurobioidea nor of Uloboridae.

A. asiatica Kishida (in NAKAJIMA 1929), n. nud., most probably refers to *Titanoeca quadriguttata*, while *A. nigra* M.-Leit. 1917 (type preservation unknown) must also be transferred to Titanoecidae (? *Goeldia*).

Aebutinoides Mello-Leitão 1943, Rev. Mus. La Plata, N.S. 3, Zool. 20, 101: *A. tigrinus* M.-Leit. 1943, *ibid.* f. 1 from the Argentine (♀ La Plata – not available). Described in Dictynidae, and listed by ROEWER (1954 a) in Dictynidae (s. str.). Transferred here into Amaurobiidae: Metaltellinae. Most probably synonymous with *Metaltella*, n. syn., but the probably specific synonymy with the species described in this genus must be left open.

Africactenus Hyatt 1954, Ann. Mag. Nat. Hist., 12. Ser. 7: 84, 888: *Ctenus* (*Leptoctenus*) *agilior* Poc. 1899, Proc. Zool. Soc. London, 873 Pl. 55: 7 from Congo (♂ London; ♀ described by HYATT *loc. cit.*: London). Ctenidae: Acanthocteninae.

A specific revision was presented in connexion with the original description. Material of numerous unidentified species was also examined in Berlin.

Agelena Walckenaer 1805, Tabl. Aran., 51. Generotype by elimination: *Araneus labyrinthicus* Cl. 1757, Aran. Svec., 79 Pl. 2: 8 from Sweden (♂ no types; ♀ described by OLIVIER 1789 sub *Aranea labyrinthica*; ♂♀ Gothenburg, Hamburg, and coll. PL) = *Agelena tubicola* Bös. & Str. 1906, Abh. Senckenb. Naturf. Ges. 30, 297 Pl. 16: 472 from Japan (♀ Frankfurt – not seen; det PL: Berlin), n. syn. Selected as the type genus for the family Agelenidae by C. L. KOCH (1837) and later generally listed in the nominate subfamily, but in Drassoidae by THORELL (1858).

About one hundred species from all the main regions of the world were originally placed in this genus, which is here radically relimited according to the principles previously applied to the Nearctic species by CHAMBERLIN & IVIE (1941, 1942 a). Obviously there are only a few Palearctic species in *Agelena*, while the remaining species must

be transferred into other Agelenine genera. It is not yet possible to complete the specific revision of this genus, but the generic affiliation of following species has been confirmed. There is considerable infraspecific variation within one population of a single species, and most probably some geographical variation. Therefore, a detailed analysis is needed to secure the final number of species, e.g., in the *labyrinthica*–*tubicola*–*livida*–*jirisanensis* complex.

Group I (*labyrinthica*): *A. livida* Sim. 1875 (♂♀ type preservation unknown; det. PL: Helsinki) = *A. gracilens* ROEWER 1959 & 1962 (♀ Gothenburg, ♂ Lund, non *A. gracilens* C. L. Koch 1841) n. syn., *A. jirisanensis* Paik 1965 (♀ Taegu – not seen), and *Agelena limbata* Thor. 1897 (♂♀ Genoa; Hamburg; det. PL: ♀ Berlin).

Group II (*gracilens*): *A. gracilens* C. L. Koch 1841 (♂♀ no types; Berlin) = *A. syriaca* C. L. Koch 1845 (♀ Berlin – dry), n. syn. = ? *A. affinis* Kulcz. 1911 (♀ presumably in Warsaw), n. syn., *Agelena opulenta* L. Koch 1878 (♀ type preservation unknown; det PL: Berlin) = *Agelena japonica* Karsch 1879 (♂♀ Berlin), n. syn., = *A. difficilis* Fox 1936 (♂ presumably Washington), n. syn. = *A. choi* Paik 1965 (♀ Taegu – not seen), n. syn., and *A. koreana* Paik 1965 (♂♀ Taegu – not seen). There is also an underscribed species from China (♀ Berlin).

Arachne timida Audoin 1827 (♂♀ no types) is evidently an *Agelena*, as listed by ROEWER (1954 a), but it cannot be exactly placed, and it is therefore considered as a nomen dubium. *A. canariensis* Lucas 1838 (♀ no types) and *A. bi-striata* Grube 1861 are also regarded here as nomina dubia. See also *Agelenella*, *Agelenopsis*, *Agroeca*, *Antistea*, *Barronopsis*, *Benoitia*, *Calilena*, *Coelotes*, *Hahnia*, *Histopona*, *Hololena*, *Lycosoides*, *Maimuna*, *Melpomene*, *Mistaria*, *Novalena*, *Rualena*, *Scotina*, *Textrix*, *Tortolena*, and *Wadotes*.

Agelenella n. gen., p. 346: *Agelena pusilla* Poc. 1903, in FORBES: Nat. Hist. Sokotra and Abd-el-Kuri, 193, from Sokotra (♀ London). Agelenidae: Ageleninae.

Agelenopsis Giebel 1869, Zeitschr. ges. Naturw. 33, 250 (*Agelenopsis*): *A. albipilis* Gieb. 1869, *ibid.* from Illinois (♂♀ type preservation unknown) = *Agelena potteri* Bl. 1846, Ann. Mag. Nat. Hist., 1. Ser. 17, 43 from Canada (♂♀ presumably Oxford; Paris). Originally assigned to Agelenidae, sometimes included in *Agelena*, e.g., by BONNET (1955). Listed here in Agelenidae: Ageleninae, most closely related with *Melpomene* and *Tortolena*. Cf. also CHAMBERLIN & IVIE (1941), GERING (1953) and KISHIDA (1955).

The specific revision of *Agelenopsis* was presented by CHAMBERLIN & IVIE (*op. cit.*), but their subgenus *Barronopsis* is treated here as a genus of its own. Material of *Agelena naevia* Walck. 1805 (no types; ♀ described by HENTZ 1847; ♂ described by BECKER 1879 sub *Agelena hentzii*: Bruxelles; Paris), *Agelena utahana* Chamb. & Iv. 1933 (♂♀ type preservation unknown; Berlin), and *Agelena pennsylvanica* C. L. Koch 1843 (♀ no types; ♂ described sub *Agelena americana* by KEYSERLING 1877; London; ♂♀ Urbana) also examined.

Aglaoctenus Tullgren 1905, Ark. Zool. 2: 19, 52: *A. bifasciatus* Tullg. 1905, *ibid.*, 53 Pl. 7: 25 from Bolivia (♀ Stockholm). Described in Pisauridae, and generally listed in Thaumasiinae (Dolomedinae). Listed here in Dolomedidae.

Agroeca Westring 1861, Göteb. K. Vet. Akad. Handl., N.S. 7, 311. Originally, *Philoica linotina* was selected as the generotype. However, it is a well known fact that WESTRING's (1851, 1861) *P. linotina* is not identical with *P. linotina* C. L. Koch 1843. According to BONNET (1955, p. 209 and 212), the former author sometimes referred to the species that was named *Liocranum lusaticum* by L. KOCH (1875), sometimes also partly to *Agelena brunnea* Blackwall 1833, which is the valid name for *P. linotina* C. L. Koch. In spite of these facts, *Agelena brunnea* was regarded as the generotype of *Agroeca* both by ROEWER (1954 a) and BONNET (*loc. cit.*). As a possibility for different interpretations exists, the selection of *A. brunnea* as the generotype must be stabilized by official decision by the International Commission on Zoological Nomenclature (ICZN 1964: § 70). There is no type material of *Agelena brunnea*, and the study of this species is mainly based on my personal collections.

Agroeca was originally assigned to Drassidae, but later transferred to Agalenoidae by THORELL (1870 a), and listed there also by HERMAN (1878), at least. WAGNER (1888) exceptionally included this genus in Dictynidae, while SIMON (1897) transferred it further to Clubionidae: Liocraninae. Here it is transferred back to the superfamily Amaurobioidea, and listed in Liocranidae. Synonyms *Agroecina*, n. syn., *Hilke*, *Lagenicola*, and *Protagroeca*.

The North American species were revised by KASTON (1938 b), and the Central European species have been recently treated by TULLGREN (1945) and LOCKET & MILDIDGE (1951). However, a preliminary survey of the Siberian species described by L. KOCH (1879 – types in Stockholm) reveals that there will be additional synonyms. A final revision of this seemingly Holarctic genus has not been possible in this context. Material of *Agelena proxima* O. P.-Cambr. 1870 (♂♀ presumably Oxford; coll. PL), *Agroeca inopina* O. P.-Cambr. 1886 (♂♀ Oxford – not seen; ♂ coll. PL), *Agroeca pullata* Thor. 1875 (♂♀ Stockholm), *Agroeca striata* Kulcz. 1882 (♂♀ presumably Budapest; Paris), and *Hilke trivittata* Keys. 1887 (♀ London; ♂ described by CHAMBERLIN 1919 sub *Herpyllus oabus*) also examined.

A. aureoplumata Keys. 1879 (♀ London) is here transferred to Corinnidae, and *A. annulipes* Sim. 1878 (♂♀ Paris; London) to Gnaphosidae: Micariinae, close to *Phrurolithus*. See also *Itatsina*, *Mesiotelus*, *Phrurolithus*, *Prochora*, and *Scotina*. Representatives of Zodariidae and related groups

have also repeatedly been described under the generic name *Agroeca*, e.g., several species of *Supunna* (cf. *Nyssus*).

Agroecina Simon 1932, Arachn. France 6: 4, 939: *Agroeca lineata* Sim. 1878, *ibid.* 4, 308 from France (♀ Paris; ♂ described by SIMON 1932). Described as a representative of Clubionidae: Liocraninae, listed here in Liocranidae. Synonymous with *Agroeca*, n. syn.

Ajmonia Caporiacco 1934, Mem. Soc. Ent. Ital. 13, 125: *A. patellaris* Capor. 1934, *ibid.* Pl. 1: 7 from Karakoram (♂ presumably lost) = *Dictyna velifera* Sim. 1906, Ann. Soc. Ent. Belg. 50, 304 from India (♂♀ Paris), n. syn. = *D. yunnanensis* Sch. 1963, Mém. Mus. Nat. Hist. Nat., N. S., Zool. 25: 1, 24 f. 7 from China (♀ Paris), n. syn. Dictynidae: Dictyninae. It is a matter of opinion whether *Dictynomorpha* and *Nigma* are considered subgenera of *Ajmonia*; here they are treated as genera.

D. psittacea Sch. 1936 (♂ Stockholm) = *A. psittacea* n. comb., *D. numidica* Denis 1937 (♂♀ Paris) = *A. numidica* n. comb., *D. patellaris* Sim. 1910 (♂ Paris) = *A. patellaris* (Sim.) n. comb. The latter name is a senior secondary homonym of the original name of the generotype, but no renominations are needed. The position of *D. gratiosa* Sim. 1881 (♀ Paris; ♂ described by SIMON 1885 c: Paris) and *D. procera* Kulcz. 1901 (♀ type preservation unknown) is puzzling. They are here included in *Ajmonia* (n. comb.), but they may represent parallel evolution in *Nigma* as well. Correspondingly, *Heterodictyna linsdalei* Chamb. & Gertsch 1958 (♂♀ New York – not seen) is here provisionally listed in *Ajmonia* (n. comb.), although it may belong to *Dictynomorpha*. There is also an undescribed species from India (♂♀ Paris) and one from Natal, South Africa (♀ Geneva).

Alauximus Bryant 1948, Bull. Mus. Comp. Zool. Harvard 100: 4, 345: *A. infumatus* Bryant 1948, *ibid.*, 347 Pl. 2: 14 from Hispaniola, West Indies (♀ Cambridge). Synonymous with *Callioplus*, n. syn. Described in Amaurobiidae, listed here in subfamily Amaurobiinae.

A. crassus Bryant 1948 (♀ Cambridge) = *Callioplus crassus* n. comb.

Alistra Thorell 1894, Bih. Sv. Vet. Akad. Handl. 20: 4, 40: *A. longicauda* Thor. 1894, *ibid.* from Sumatra (♀ Stockholm) = *Hahnina weyersi* Sim. 1899, Ann. Soc. Ent. Belg. 43, 101 from Sumatra (juv. ♀ Paris; Berlin), n. syn. Originally assigned to Agalenoidae, but later generally listed in Hahniidae. Synonyms *Aviola*, *Bigois*, and *Nannonymphaeus*, all n. syn.

Aviola stenura Sim. 1898 (♂♀ Paris) = *Alistra stenura* n. comb., *Aviola radleyi* Sim. 1898 (♂♀ Paris) = *Alistra radleyi* n. comb., *Bigois myops* Sim. 1898 (♀ Paris) = *Alistra myops* n. comb., *Hahnina taprobanica* Sim. 1898 (♀ Paris) = *Alistra taprobanica* n. comb., *Nannonymphaeus pusillus*

Rainb. 1920 (♂ Adelaide) = *Alistra pusilla* n. comb., and *Hahnia astrolomae* Hickm. 1948 (♂♀ Hobart – paratypes examined: coll. HICKMAN) = *Alistra astrolomae* n. comb. There is also unidentified material of two species, one from Bismarck Archipelago, Melanesia (♀ Berlin), and one from Tonkin, China (♂ Paris), but is it not certain whether they really represent undescribed species, as some of the named species are known only in either of the sexes, and, on the other hand, the simple structure of the genital organs makes it difficult to identify the species of this widespread genus.

Altella Simon 1884, Bull. Soc. Zool. France 9, 321 as a nomen novum for *Amphissa* O. Pickard-Cambridge (see this genus). Described as a Dictynid genus, listed here in subfamily Tricholathysinae; very closely related with *Argenna*. Thus *Altella* could be listed as a subgenus of *Argenna* as well, but to ensure greatest possible stability of the nomenclature, the other alternative has been chosen here. Cf. also the opinions of BRAUN and MILLER (in MILLER 1966). Synonym: *Attellela*, n. syn.

Group I (*lucida*): *A. opaca* Sim. 1910 (♂♀ Paris).

Group II (*uncata*; syn. *Attellela*): *A. uncata* Sim. 1884 (♂♀ Paris) = *rupicola* Sim. 1884 (♂♀ Paris), n. syn. = *A. desertorum* Sim. 1910 Sim. 1910 (♂ Paris), n. syn. and *Attellela biuncata* Mill. 1949 (♂♀ Brno) = *Altella biuncata* n. comb. For synonyms of the latter species, see *Attellela*.

A. conglobata Dyal 1935 (type preservation unknown) must be transferred into Uloboridae, but its exact position remains obscure. For the revised position of other species, see *Argenna*, *Devade*, and *Lathys*.

Attellela Miller 1949, Ent. Listy Brno 12, 88: *A. biuncata* Mill. 1949, ibid., 90 Pl. 1: 1–7 from Czechoslovakia (♂♀ Brno) = *Argenna lucida*: Kulcz. 1898, Symbol. Faun. Aran. Austr. Infer., 54 Pl. 1: 4 from Austria (cf. MILLER 1949) = *Altella lucida*: Wiehle 1953 (♀ – non ♂), n. syn. non *Lethia lucida* Sim. 1874. Described in Dictynidae, listed here in subfamily Tricholathysinae. Synonymous with *Altella*, n. syn.

Altellopsis Simon 1905, Boll. Mus. Zool. Torino 20: 511, 2: *A. helvola* Sim. 1905, ibid. from Patagonia (♀ Paris). Described in Dictynidae, transferred here into Amaurobiidae, and selected as the type genus of the subfamily Altellopsinae. Sen. homon. of *Altellopsis* Mello-Leitão 1924.

Altellopsis Mello-Leitão 1924, Bol. Mus. Nac. Rio de Janeiro 1: 4, 275: *A. luteus* M.-Leit. 1924 from Brasil (♀ type preservation unknown). Described in Dictynidae, transferred here into Amaurobiidae: Metaltellinae. Obj. synonym. of *Paraltellopsis*, obviously synonymous with *Ciniflrella* (cf. ROEWER 1954 a, p. 1304).

Amaloxenops Schiapelli & Gerschman de Pike-lin 1958, Rev. Mus. Arg. Ci. Nat., Zool. 3: 4, 203: *A. vianai* Schiap. & G.-Pik. 1958, ibid., f. 10–15 from the Argentine (♂♀ Buenos Aires – not seen). Described in Hahniidae, listed here in Hahniinae.

Bigois palmarum Schiap. & G.-Pik. 1958 (♀ Buenos Aires – not seen) may also be a representative of this genus. See also *Bigois* and *Intihuatana*.

Amarara R. Marples 1959, Trans. R. Soc. N. Zealand 87: 3–4, 354: *A. fera* R. Marpl. 1959, ibid., Pl. 3: 8 & 11 from New Zealand (♂♀ Dunedin – unidentified material examined) = *Stiphidion facetum* Sim. 1902, Bull. Soc. Ent. France 71, 242, n. syn. from Tasmania (♂, non juv.! Paris). Described in Dictynidae, transferred here to Amaurobiidae: Stiphidiinae. Synonymous with *Stiphidion*, n. syn.

Amathia Simon 1873, Mém. Soc. R. Sci. Liège, 2. Ser. 5, 11. This new generic name was published in the index of this work, arranged as a schema of classification, and listed there in Eresidae without any named species. However, it is evident that SIMON meant to create this genus for the species which was later described as *Adonea fimbriata*, n. gen., n. sp. (p. 342). The name *Amathia* has not since been listed, except by AUSSERER (1878). Thus it remains a nomen nudum. Junior homonym of *Amathia* Lamouroux 1812, *Amathia* Roux 1828, *Amathia* Duponchel 1829, *Amathia* Rathke 1837, and *Amathia* Walk-er 1852.

Amaurobioides O. Pickard-Cambridge 1883, Proc. Zool. Soc. London 1883, 356: *A. maritimus* O. P.-Cambr. 1883, ibid. Pl. 36: 3 from New Zealand (♀ London; ♂ described by HICKMAN 1949 sub *A. litoralis*: Hobart – comp. HICKMAN; Frankfurt). Described in Drassidae, listed by SIMON (1897) as Clubionidae incertae sedis. Later he synonymized *Amaurobioides* with *Uliodon* (SIMON 1903 a), and transferred this genus to subfamily Cteninae. This practice has been followed by most later authors, and the representatives of *Amaurobioides* have been catalogued under Ctenidae: Cteninae (ROEWER 1954 a, BONNET 1955). However, HOGG (1909) did not accept the synonymization, and he transferred this genus into Clubionidae: Clubioninae. Finally, HICKMAN (*op. cit.*) created the family Amaurobioididae. Here it is listed tentatively in Miturgidae: Amaurobioidinae.

HICKMAN (1951) synonymized all the species described, but, in my opinion, there seems to be an additional species, *A. africanus* Hewitt 1917 (♂♀ Grahamstown – not seen; ♀ London).

Amaurobius C. L. Koch 1836, in HERRICH-SCHÄFFER: Deutschl. Crust. Myr. Arachn. 8, Pl. 5 – 6. No generotype selected. Proposed by LEVI & KRAUS (1964) to be officially rejected. Synonymous with the Agelenid genus *Coelotes*. Cf. also below and *Pireneilega*.

Amaurobius C. L. Koch 1837, Uebers. Arachnidensyst, 1, 15 Pl. 3: 29. Originally no types were selected, but the only figure refers to *A. montanus* C. L. Koch 1837 (♀ Berlin – dry), which was later synonymized with *Clubiona claustraria* Hahn 1831 and is here included in *Callobius*. Besides, *A. claustrarius* was listed first by C. L. KOCH (1837). THORELL (1870 a, p. 126) designated *A. fenestralis* (Strøm) 1768 as the generotype. After repeated confusion concerning the rules of priority as well as type selection, LEVI & KRAUS (1964) proposed the inclusion of this genus in the official list of valid names, and also the stabilization of the generotype selection in favour of *Aranea fenestralis* Strøm 1768, Trondh. Selsk. Skr. 4, 362 Pl. 16: 23 from Norway (♂ no type material; ♂♀ coll. PL). The genus *Amaurobius* was originally described in Drassides, but transferred to Agelenidae by OHLERT (1854) and selected as the type genus for the subfamily Amaurobiinae by THORELL (1870 a). As such this genus is sometimes listed in Amaurobiidae (BERTKAU 1878 & subseq. authors), sometimes in Dictynidae (s. lat.) (SIMON 1874 & subseq. authors). I agree with PETRUNKEVITCH (1939 a), who listed this genus in Amaurobiidae: Amaurobiinae. Synonym: *Ciniflo*. The definition and limitation of *Amaurobius* are here radically different from those in the catalogues of ROEWER (1954 a) and BONNET (1955), and it is restricted to only about a dozen Palearctic species. Cf. also the quite recent opinions by LEVI & KRAUS (1964) and HUBERT (1965).

A comprehensive revision of this genus has not been possible, as many of the holotypes are either lost, or preserved in collections that are not known to me. However, I have at least tried to place each of the species in the correct group.

Group I (*fenestralis*): *Ciniflo erberii* Keys. 1863 (♂♀ London; numerous collections), *C. similis* Bl. 1861 (♂♀ Oxford – not seen; Basle & coll. PL), and *A. cerberus* Fage 1931 (♂ Paris).

Group II (*ferox*): *Clubiona ferox* Walck. 1825 (no types; ♂♀ described by WALCKENAER 1837; ♂♀ numerous collec-

tions = *A. peninsulanus* Banks 1898 (♂♀ type preservation unknown), n. syn., = ? *A. aculeatus* Frang.-Balb. 1926 (type preservation unknown), n. syn., *A. scopoli* Thor. 1871 (♂♀ Stockholm; Paris) = ? *A. franganilloi* Roew. 1951 (nomen novum for *A. inermis* Frang.-Balb. 1920: ♀ type preservation unknown), n. syn., *A. jugorum* L. Koch 1868 (♀ London; ♂ described by CANESTRINI & PAVESI 1870 sub *A. crassipalpis*; ♂♀ Genoa, Paris, Stockholm & coll. Pole-nec), *A. occidentalis* Sim. 1892 (♀ Paris; ♂ described by BACELAR 1929), *A. vachoni* Hubert 1965 (♀ Paris).

Group III (*pallidus*): *A. pallidus* L. Koch 1868 (♀ London; ♂ described by CHYZER & KULCZYNSKI 1897: Budapest; Vienna, det PL: Hamburg), *A. kratohvili* Mill. 1938 (♀ type preservation unknown), *A. minor* Kulcz. 1915 (♀ type preservation unknown) = ? *A. drenskii* Krat. 1934 (♀ type preservation unknown), n. syn. = *A. provisoricus* Kolosv. 1939 (♂ type preservation unknown), n. syn., *A. annulatus* Kulcz. 1906 (♀ type preservation unknown), *A. barbarus* Sim. 1910 (♂♀ Paris) = *A. annulatus* Sim. 1874 (♂♀ Paris – n. nud., non *A. annulatus* Kulcz.), n. syn., *A. festae* Capor. 1934 (♂ type preservation unknown), *A. hercegovinensis* Kulcz. 1915 (♂♀ Warsaw), and *A. obustus* L. Koch 1869 (♂♀ London; numerous collections).

Group IV (*latebrosus*): *A. latebrosus* Sim. 1874 (♂ Paris; ♀ described by HUBERT 1965: Paris). There is also an undescribed species of this group from Crete (♀ Gothenburg), identified as *A. claustrarius* by ROEWER (1959).

The females of West-European species of *Amaurobius* have been recently figured by HUBERT (*op. cit.*).

A. brevis Tacz. 1874 (♀ Warsaw), *A. cayanus* Tacz. 1874 (♀ Warsaw), *A. hirtus* Tacz. 1874, and *A. rufipes* Tacz. 1874 (♂♀ Warsaw) are here transferred to Corinnidae, and they are obviously all congeneric (cf. also SIMON 1898 a, p. 200). *A. tristis* L. Koch (♀ type preservation unknown), non *Titanoeca tristis* L. Koch 1872 (cf. ROEWER 1954 a, p. 1373) is a representative of Titanocidae, and perhaps *A. thoracicus* M.-Leit. 1945 (juv. La Plata – SCHIAPELLI & GERSCHMAN DE PIKELIN in litt.) and *A. arnozi* M.-Leit. 1924 (♀ type preservation unknown) also belong there. *A. asuncionis* M.-Leit. 1946 (juv., non ♀ La Plata – SCHIAPELLI & GERSCHMAN DE PIKELIN in litt.) is very poorly preserved and cannot be placed. The fossil species *A. faustus* Koch & Ber. 1854, *A. rimosus* Koch & Ber. 1854, and *A. spinimanus* Menge 1854 obviously do not belong to this genus, but their position remains unknown to me (cf. also PETRUNKEVITCH 1942, p. 212 – 213), while *A. succini* Petr. 1942 may belong to Amaurobiidae. All Australian species that have been described in *Amaurobius* but not yet finally revised, certainly belong to subfamily Matachiinae. For present status of the species transferred here to other revised genera of this list, see *Anisacate*, *Arctobius*, *Badumna*, *Callioplus*, *Callobius*, *Coelotes*, *Cryphoea*, *Cybaeus*, *Devade*, *Emblyna*, *Exlinea*, *Goeldia*, *Lathys*, *Metalrella*, *Nurscia*, *Oramia*, *Pandava*, *Phryganoporus*, *Pimus*, *Racius*, *Taira*, *Tamgrinia*, *Titanoeca*, *Vidole*, and *Walmus*. Some species have previously been transferred to families outside the scope of this paper (see BONNET 1955, p. 273 – 275).

Ambika n. gen., p. 304: *Oecobius putus* O. P.-Camb. 1876, Proc. Zool. Soc. London 1876, 450 Pl. 58: 1 from Egypt (♂♀ Oxford – not seen; ♀ London). Oecobiidae: Oecobiinae.

Ameromma Kishida 1955 (? 1928), Acta Arachn. 14: 1, 7: *Chorizomma californica* Sim.

1895, Bull. Soc. Zool. France 20, 136 from California (♂ Paris; ♀ described by CHAMBERLIN & IVIE 1937; Portal). Originally assigned to Agelenidae: Cicurinae, tribus Chorizommataini, listed here in Dictynidae: Cicurinae.

All Agelenid species referred to by KISHIDA (1955) with the authorship and date «Kishida 1928» most probably refer to mere manuscript names (YAGINUMA in litt.). In any case, a valid description of them has never been published, and a possible earlier description in Japanese does not affect the priority. Thus, *Ameromma* has been regarded here as a junior synonym of *Yorima* Roth 1954.

†*Amphiclotho* Gourret 1887, Rec. Zool. Suisse 4: 3, 465: *A. breviscula* Gourr. 1887, ibid. 1 Pl. 22: 18 from a calcareous swamp in France (Oligocene, types presumably in Marseilles). Described in Uroctidae, listed here in Oecoobiidae: Uroctinae.

Amphigyriodes Strand 1912, Wiss. Erg. Deutsch. Z.-Afr. Exp. 4, Zool. 2: 11, 327: *A. bifoventata* Str. 1912, ibid., 328 from Ruanda (♀ Berlin). Described in Amaurobiidae, listed here in subfamily Phyxelidinae, and synonymized with *Phyxelida*, n. syn.

Amphigyrum Tullgren 1910, Wiss. Erg. Schweizer Zool. Exp. Kilimandjaro, Meru 20: 6, 93: *A. nebulosum* Tullg. 1910, ibid. Pl. 1: 3 from Kenya (♀ Stockholm; ♂ described by CAPORIACCO 1949) = *Haemilla tanganensis* Sim. & Fage 1922, Arch. Zool. Exp. Gén. 60: 17, 526 f. 1 from Kenya (♂♀ Paris), n. syn. Originally described in Dictynidae, sometimes listed in Amaurobiidae (ROEWER 1954 a), here in Amaurobiidae: Phyxelidinae. Synonymous with *Phyxelida*, n. syn., but L. BERLAND (1914) has regarded *Amphigyrum* as a synonym of *Haemilla*.

Amphinecta Simon 1898, Hist. Nat. Araign. 2: 2, 235: *A. decemmaculata* Sim. 1898, ibid. from New Zealand (♂ Paris). Originally described in Agelenidae (group Argyronetae), sometimes listed in Argyronetidae (ROEWER 1954 a), sometimes in Agelenidae: Cybaeinae (PETRUNKEVITCH 1928). Transferred here to Amaurobiidae: Desinae.

Rubrius milvinus Sim. 1903 (♀ Paris) = *A. milvina* n. comb. This female from Tasmania may be conspecific with the genotype.

Amphissa O. Pickard-Cambridge 1882, Ann. Mag. Nat. Hist., 5. Ser. 9, 3: *Lethia spinigera*

O. P.-Cambr. 1881, Proc. Dorset F. Cl. 2, 468 from England (♂ Oxford – not seen; Berlin) = *L. lucida* Sim. 1874, Arachn. France 1, 203 from France (♀ Paris) = *Attella bertkaui* Wiehle 1967, Senck. Biol. 48, 29 f. 130 – 138 from Germany (♂♀ coll. WIEHLE – not seen). Jun. homon. of *Amphissa* Adams 1853 and of *Amphissa* Walker 1855. Obj. synonym. of *Attella*.

Anachemmis Chamberlin 1920, Journ. Ent. Zool. Claremont 12, 13: *A. sober* Chamb. 1920, ibid. Pl. 5: 5 from California (♀ New York; ♂ New York). Described in Clubionidae Micariinae, transferred here to Miturgidae Tengellinae and synonymized with *Titilotus* (IVIE pers. comm.)

Anahita Karsch 1879, Verh. Nat. Ver. Rheinl. Westfalen 36, 103: *A. fauna* Karsch 1879, ibid., 9 Pl. 1: 18 from Japan (♀ Berlin) ♂ described by BÖSENBERG & STRAND 1906; ♂♀ Osaka II). Described as intermediate between Lycosoidae and Drassoidae, but transferred by SIMON (1897) to Clubionidae: Cteninae, and since PETRUNKEVITCH (1928) generally listed in Ctenidae: Calocteninae. Listed here in Ctenidae: Acanthocteninae. Synonym *Nydia*.

Lycosa animosa Walck. 1837 (no types; ♂♀ New York) is a close relative of the genotype, while *Nydia punctata* Thor. 1890 and *A. multidentata* Schenkel 1936 are most probably synonymous with the genotype, and *A. nathani* Str. 1906 that of the other species, but all of them have been described from juvenile specimens only. The Ethiopian species, usually referred to this genus, seemingly belong elsewhere, and *A. mamma* Karsch 1884 (♀ Berlin), *A. lineata* Simon 1896 (♂ Paris), *A. lurida* Simon 1896 (♀ Paris), *A. icterica* Simon 1910 (♂ Paris), and *A. kiwuensis* Str. 1915 (♂♀ Berlin) all seem to be more closely related to Ethiopian species of *Caloctenus*. Cf. also *Isocetus*.

Anattella Denis 1947, Rev. Franç. Ent. 14: 2, 145: *A. jubata* Den. 1947, ibid., 146 f. 1–2 from France (♀ Paris). Described in Dictynidae, listed here in subfamily Cicurinae. Synonymous with *Lathys*, n. syn.

Anaxibia Thorell 1898, Ann. Mus. Civ. Genova 39, 271: *A. caudiculata* Thor. 1898, ibid., 272 from Burma (♀ Genoa). Described in Dictynidae, listed here in subfamily Dictyninae.

Dictyna pictithorax Kulcz. 1908 (♂♀ Warsaw) = *A. pictithorax* n. comb., *D. nigricauda* Sim. 1905 (♀ Paris) = *A. nigricauda* n. comb., *D. petersi* Less. 1933 (♂♀ Geneva) = *A. petersi* n. comb., *Mallos difficilis* Kraus 1960 (♂ Paris) = *A. difficilis* n. comb., and *D. rebai* Tikad. (♀ Calcutta, non ♂ = *Nigma shiprai* (Tikad.)) = *A. rebai* n. comb. There is also an undescribed species from Singapur (♀ Warsaw), and probably *D. albida* O. P.-Cambr. 1885 (♀ type preservation unknown) also belongs here.

Ancylometes Bertkau 1880, Mém. couron. acad. Belg. 43, 114; *A. vulpes* Bertk. 1880, ibid. from Brasil (type preservation unknown; ♀ described by PETRUNKEVITCH (1910). Originally assigned to Lycosoidae s. lat.; generally listed in Pisauridae: Thalassinae since SIMON (1897). Transferred here into Ctenidae: Thalassinae. Cf. also S. LUCAS (1964). Synonym *Lyoclenus*.

For the list of species included here see S. LUCAS (*op. cit.*). Material of *A. amazonicus* Sim. 1898 (♂ Paris), *L. demerarensis* F. O. P.-Cambr. 1897 (♂ London), *Ctenus bogotensis* Keys. 1876 (♂♀ London), and *L. paraguayensis* Str. 1909 (♂ Berlin) examined.

Andoharano n. gen., p. 301: *Filistata decaryi* Page 1945, Bull. Mus. Hist. Nat. Paris, 2. Ser. 17: 4, 301 from Madagascar (♂♀ Paris). Filistatidae; a largely deviating genus.

F. grandidieri Sim. 1901 (♂ Paris) = *A. grandidieri* n. comb.

†*Androgeus* C. L. Koch & Berendt 1854, in BERENDT: Die im Bernstein befindlichen organischen Reste der Vorwelt 1: 2, 27; *A. triquetus* Koch & Ber. 1854, ibid., 29 Pl. 16: 134 from Baltic amber (types lost). Orthography corrected to *triquetrus* by BONNET (1955, p. 321). Described in Mithraeidae, and included with hesitation in Uloboridae by BONNET (1955). MENGE (in KOCH & BERENDT 1854, p. 29) included *Androgeus* with some doubts in «Krebspinnen» (= Thomisidae). Most probably it is neither a Cribellate genus nor a direct derivative of the groups treated. Sen. homon. of *Androgeus* Stål 1865. *Androgeus* Berendt 1845 (BERENDT *op. cit.* 1: 1, 56) is a nomen nudum.

Andromma Simon 1893, Hist. Nat. Araign. 1: 2, 390; *A. aethiopicum* Sim. 1893, ibid. f. 346–348 from Ethiopia (♂♀ Paris). Originally assigned to Drassidae: Cybaeodinae, but sometimes listed in Clubionidae: Liocraninae, e.g., by PETRUNKEVITCH (1928) and ROEWER (1954 a). Transferred here outside the groups treated, obviously a representative of Zodarioidea.

Anisacate Mello-Leitão 1941, Rev. Mus. La Plata, N.S. 2, Zool., 113; *A. fragile* M.-Leit. 1941, ibid., 114 f. 12 from Argentina (♀ La Plata – not available). Described in Dictynidae, transferred here to Amaurobiidae: Macrobulinae.

Amaurobius fuegianus Sim. 1884 (♀ Paris) = *Auximus fuegianus*: Sim. 1892 (TULLGREN 1901: ♀ Stockholm) = *Anisacate fuegianus* n. comb. Without comparison of the type material it is impossible to state whether this species is synonymous with the generotype or not.

Anoteropsis L. Koch 1878, Arachn. Austral. 1: 2, 971; *A. flavescens* L. Koch 1878, ibid., Pl. 85: 1 from New Zealand (♀ type preservation unknown). Described in Lycosoidae, transferred to Pisauridae Dolomedae by SIMON (1898 a), and later generally listed in Thaumasiinae. Listed here as Lycosoidea incertae sedis (Zoridae

or Cycloctenidae). The genera *Anoteropsis* and *Toxopsiella* partly overlap, but the mutual relationship of the generotypes remains unknown to me.

The specific revision of *Anoteropsis* remains incomplete, as I have only examined material of *A. flavovittata* Sim. 1880 (♂♀ Paris).

Antistea Simon 1898, Hist. Nat. Araign. 2: 2, 271; *Agelena elegans* Bl. 1841, Trans. Linn. Soc. London 18, 619 from England (♂♀ Oxford – not seen; coll. PL). Originally described in Ageleidae: Hahniinae, but generally listed in Hahniidae, here in subfamily Hahniinae.

A. brunnea (Emert.) 1909 (♀ Cambridge; ♂ described by GERTSCH 1934) also belongs here. *Hahnia flaviceps* Emert. 1913 (♂♀ New York) and *H. picta* Chyz. & Kulcz. 1897 (♂♀ type preservation unknown) belong to the vicinity of *Antistea*, at least, although they may represent a new genus.

Anuvinda n. gen., p. 381: *Titanoeca escheri* Reim. 1934; Rev. Suisse Zool. 41: 32, 436 f. 7 from Deccan (♀ Geneva). The generotype was described in Amaurobiidae, but the new genus is assigned to Titanocidae.

Anyphaena Sundevall 1833, Consp. Arachn., 20 (*Anyphoena*), orthography corrected by C. L. KOCH (1837). Generotype by original monotypy: *Aranea accentuata* Walck. 1802, Faun. Paris. 2, 226 from France (no types; ♀ described by SUNDEVALL 1832, ♂ by WALCKENAER 1837, both sub *Clubiona accentuata*; ♂♀ coll. PL). Originally assigned to Drassidae, transferred to Agelenidae by C. L. KOCH (1837), and further selected as the type genus for the family Anyphaenidae by BERTKAU (1878). Repeatedly listed also in Clubionidae: Anyphaeninae since SIMON (1884 a), and even in Dictynidae by WAGNER (1888). In my opinion, Anyphaenidae is a well defined family in the branch Amaurobiidae, and probably it is a derivative of Amaurobiidae: Macrobulinae, and thus without Ecribellate, two-clawed relatives. Only the type genus of this large family is revised here, although representatives of several genera have been preliminarily examined.

No specific revision of this large genus has been carried out.

Aphycoschaema Simon 1902, Bull. Soc. Ent. France 1902: 15, 242; *A. hygrophila* Sim. 1902, ibid. from Queensland (♂♀ Paris). Described in Dictynidae, but generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Listed

here in Amaurobiidae: Matachiinae. Synonymized here with *Badumna*, n. syn., but evidently the smallest species of this genus could be separated as a subgenus. Cf. also *Derxema*.

See also *Baiami*, *Epimecinus*, and *Forsterina*.

Apolania Simon 1897, Ann. Soc. Ent. France 66, 384: *A. segmentata* Sim. 1897, ibid. from Seychelles, Indian Ocean (♂ Paris). Described in Clubionidae: Cteninae, Calocteneae, and later generally listed in Ctenidae: Calocteninae, except in Argocteninae by MELLO-LEITÃO (1940 a). Listed here as Ctenidae incertae sedis.

Apostenus Westring 1851, Göteb. K. Vet. Akad. Handl. 7, 46: *A. fuscus* Westr. 1851, ibid. from Sweden (no types; ♂♀ described by WESTRING 1861; Stockholm & Helsinki). Described in Drassidae, transferred to Agelenoidae by AUSSERER (1867), and further to Clubionidae: Liocraninae by SIMON (1897). Listed here in Liocranidae, in Amaurobioidea.

The specific revision of this genus has not yet been carried out. See also *Dirksia* and *Agroeca*. *Apostenus rutilius* Sim. 1896 (♀ Paris) certainly belongs elsewhere.

Arachne Savigny & Audouin 1825, in SAVIGNY: Descr. Egypt. Hist. Nat. 1: 4, 113: *A. familiaris* Sav. & Aud. 1825, ibid. from Egypt (no types) = *Araneus domesticus* Cl. 1757, Aran. Suec., 76 from Sweden (no types). Generally included in Agelenidae after the creation of this family. Synonymous with *Tegenaria*.

Aranea Latreille 1806, Gen. Crustac. Insect. 1, 94: *Araneus domesticus* Cl. 1757, Aran. Svec., 76 from Sweden (no types). Synonymous with *Tegenaria* (see *Arachne*). Jun. homon. of *Aranea* Linné 1758, sen. homon. of *Aranea* Perry 1810.

Arangina n. gen., p. 359: *Dictyna cornigera* Dalmas 1917, Ann. Soc. Ent. Fr. 86, 336 f. 9–12 from New Zealand (♂♀ Paris; Dunedin). Dictynidae: Dictyninae.

According to unpublished figures of FORSTER (in litt.), there are additional species of this genus in New Zealand, at least.

Archaeodictyna Caporiacco 1928, Ann. Mus. Civ. Genova 53, 79: *Dictyna anguineiceps* Sim. 1899, Ann. Soc. Ent. France 68, Bull., 244 f. 1–3 from Egypt (♂♀ Paris: Genoa) = *D. cyrenaica* Capor. 1933, Ann. Mus. Civ. Genova 56, 314 f. 1 from Libya (♂♀ Genoa) n. syn. Dictynidae: Dictyninae. The definition and limitation of *Archaeodictyna* is here widened.

D. conducta O. P.-Cambr. 1876 (♂♀ Oxford; Geneva, Wien) = *D. olivacea* Sim. 1885 (♂♀ Paris) n. syn. = *D. abyssinica* Strand 1906 (♀ types destroyed) n. syn. = *D. montana* Tullg. 1910 (♂♀ Stockholm, in part; Berlin) n. syn. = *D. sedilloti deserta* Sim. 1910 (♀ Paris, in part + *A. anguineiceps*, = *A. conducta* n. comb. = *D. suedicola* Sim. 1890 (♂♀ syn-types in Warsaw – Paris) = *A. suedicola* n. comb., *D. sexnotata* Sim. 1890 (♂♀ Paris) = *A. sexnotata* n. comb., *D. minutissima* Mill. 1957 (♂♀ Brno) = *A. minutissima* n. comb., *D. tazzeiti* Den. 1953 (♂ type preservation unknown) = *A. tazzeiti* n. comb., *D. consecuta* O. P.-Cambr. 1872 (♂♀ Oxford) = *D. sedilloti* Sim. 1875 (♂ Paris; Basle) n. syn. = *D. pygmaea* Thor. 1875 (♂ Stockholm, palpus in Helsinki) n. syn. = ? *D. cronebergi* Sim. 1889 (♀ type preservation unknown) n. syn. = *D. latens*: Bösenberg 1902 (♂♀ material not seen, cf. HOLM 1945) = *D. terricola* Holm 1945 (♂♀ Uppsala, coll. PL & O. Lindqvist) n. syn. = *A. consecuta* n. comb. It is possible that there are structurally very close geographical races. *D. ammophila* Menge 1871 (♂♀ types destroyed; Basle, Stockholm, Paris, coll. J. Prószyński) = *Dictyna boiorum* Sim. 1881 (♂♀ Paris) n. syn. *A. ammophila* n. comb.

There are at least three undescribed Ethiopian species of this genus (Geneva, Dundo), and *D. bispinosa* Sim. 1906 (♂ Paris) may also belong here.

Archipirata Simon 1898, Hist. Nat. Araign. 2: 2, 314: *A. tataricus* Sim. 1898, ibid. from Turkestan (♀ type preservation unknown). Described in Pisauridae: Dolomedae, and later generally listed in Thaumasiinae. Listed here in Dolomedidae.

Arctella Holm 1945, Ark. Zool. 36 A: 15, 70: *A. lapponica* Holm 1945, ibid., 71 f. 23 from Lapland (♂♀ Uppsala; Helsinki, coll. PL). Sometimes regarded as only a subgenus of *Tricholathys* (HOLM 1960). Cf. also CHAMBERLIN & GERTSCH (1958). Described in Dictynidae, listed here in subfamily Tricholathysinae.

Argenna yakima Chamb. & Gertsch 1958 (♂♀ New York) may belong to this genus rather than to *Argenna*.

Arctobius n. gen., p. 334 (the reference by LINDQVIST 1964, to my manuscript name is a mere nomen nudum, as the combination was not provided with the author's name or other unambiguous indication concerning the specific name used): *Amaurobius agelenoides* Emert. 1919, Canad. Ent. 51, 106 Pl. 1: 1 from British Columbia (♂♀ Cambridge: ♂ juv.; ♂♀ coll. PL, ♀ New York and det. PL: Helsinki). The genotype was included in *Hesperauximus* by CHAMBERLIN (1947). The new genus is here listed in Amaurobiidae: Macrobininae.

Argenna Thorell 1870, On Europ. Spid., 119: *A. mengei* Thor. 1870, ibid., 123 from Sweden (♂♀ Stockholm) = *Drassus subniger* O. P.-Cambr. 1861, Ann. Mag. Nat. Hist., 3. Ser. 7,

430 from England (♀ Oxford – not seen; coll. PL) = *A. pallida* L. Koch 1881, Abh. Nat. Ges. Görlitz 17, 56 Pl. 2: 8 from Germany (♀ London), n. syn. Originally assigned to Drassoidae s. lat., always listed in Dictynidae since the creation of this family, here in subfamily Tricholathysinae. For relations with other genera, see *Altella*.

Dictyna albopunctata Menge 1869 (♂♀ types lost) = *D. patula* Sim. 1874 (♀ Paris; ♂ described sub *D. crassipalpis* by F. DAHL 1883; ♀ Helsinki & Stockholm) n. syn. However, the stabilization of the well-known name, *Argenna patula* (Sim.), will be proposed, mainly because there is no type material of *D. albopunctata*. Besides, *A. obesa* Emert. 1911 (♂♀ Cambridge; Paris & Helsinki) also certainly belongs to this genus, while the status of *A. testacea* Bertk. 1883, *A. minima* Kulez. 1898, and *Altella polita* Banks 1898 remains somewhat obscure in the absence of type material. *Argenna fossilis* Petr. 1958 most probably belongs elsewhere. See also *Altella*, *Arctella*, *Brommella*, *Hackmania*, *Iviella*, and *Lathys*.

Argennina Gertsch & Mulaik 1936, Amer. Mus. Novit., 851, 2: *A. unica* Gertsch & Mul. 1936, ibid. f. 5 from Texas (♀ New York). Described in Dictynidae, listed here in subfamily Tricholathysinae.

See also *Iviella* and *Tricholathys*.

Argistes Simon 1897, Hist. Nat. Araign. 2: 1, 143: *A. velox* Sim. 1897, ibid., 144 from Ceylon (♂ Paris). Described in Clubionidae: Liocraninae. Transferred here outside the groups treated, to the vicinity of the genus *Carteronius*.

Argoctenus L. Koch 1878, Arachn. Austral. 1: 2, 990: *A. igneus* L. Koch 1878, ibid. Pl. 86: 4 from Australia (♀ Hamburg), type designated by SIMON (1897). Originally assigned to Ctenidae, and later generally listed in Cteninae, except by MELLO-LEITÃO (1940 a and later), who selected this as the type genus of subfamily Argocteninae. Listed here in Zoridae. Synonym *Miturgina*.

There are considerable differences between the species examined by myself, but all of them are certainly representatives of the same tribe, at least, although this genus probably will be split later. The most deviating species is *A. hystriculus* Sim. 1909 (♀ Berlin). Material of *A. aureus* Hogg 1911 (♀ London), *A. nebulosus* Sim. 1909 (♀ Berlin), *A. pictus* L. Koch 1878 (♀ Berlin; ♂ undescribed – ♂♀ det. PL: Berlin), and *Miturgina vittata* Sim. 1888 (juv. ♀ Paris) examined. *Cycloctenus vittatus* Rainb. 1920 (♀ Adelaide) = *Argoctenus vittatus* n. comb. This is a secondary junior homonym of *A. vittatus* (Sim.) 1888, but also a probable synonym.

Argus Walckenaer 1841, Hist. Nat. Ins. Apt. 2, 347. Originally no generotype was designated, but 67 species were assigned to this genus. According to BONNET (1955, p. 702), they represent 40 recent genera. BONNET (*loc. cit.*) designated the first species listed, *A. longipes*, as the generotype and simultaneously synonymized *Argus* with *Zodarium*; the name of the generotype refers in part to *Enyo*

longipes Sav. & Aud. 1825 = *E. nitida* Sav. & Aud. 1825, in part to *Enyogallica* Sim. 1873. There are no type material of any of these species, but material of both species has been examined (♂♀ Paris & Berlin). Described in Agelenidae, transferred to Zodariidae by BONNET (*loc. cit.*); all the species assigned to *Argus* were formerly distributed among Linyphiidae: Linyphiinae and Erigoninae, Theridiidae, Clubionidae (now: Liocranidae), Zodariidae, Dictynidae, and Hahniidae. Junior homonym of *Argus* Bohadsch 1761, *Argus* Scopoli 1763, *Argus* Scopoli 1777, *Argus* Poli 1791, *Argus* Temminck 1807, *Argus* Lamareck 1817, and *Argus* Boisdual 1832. Synonymous with *Zodarium*.

See BONNET (1955, p. 702 – 704).

Argyroneta Latreille 1804, N. Dict. Hist. Nat. 24, 134: *Araneus aquaticus* Cl. 1757, Aran. Svec., 143 from Sweden (♂ no types; ♀ described by SUNDEVALL 1831 sub *Argyroneta aquatica*; ♂♀ Paris, coll. PL, Saaristo & Eriksson). Listed first in Drassides by SUNDEVALL (*op. cit.*), until THORELL (1870 a) selected it as the type genus of Agelenoidae: Argyronetinae that was raised to family rank by MENGE (1871). Listed here as the sole genus of Dictynidae: Argyronetinae.

See also *Desis* and *Elvina*. The status of the fossil species, *A. longipes* Heer 1865 remains obscure, but it obviously belongs elsewhere. For species of other spider groups originally assigned to *Argyroneta*, see BONNET (1955, p. 724).

Ariston O. Pickard-Cambridge 1896, Biol. Centr. Amer., Aran. 1, 216: *A. albicans* O. P.-Cambr. 1896, ibid. Pl. 27: 9 from Mexico (♀ London). Described in Uloboridae, listed here in subfamily Uloborinae (ROEWER 1954 a).

MUMA & GERTSCH (1964) have revised the species of this genus, including also species with males.

† **Arthrodictyna** Petrunkevitch 1942, Trans. Conn. Acad. Arts Sci. 34, 219: *A. segmentata* Petr. 1942, ibid. Pl. 43: 407 – 414 & 67: 602 from Baltic amber (juv. London – not seen). Selected as the type genus of the family Arthrodictynidae by original description. PETRUNKEVITCH (*op. cit.*) emphasized its affinities to Dictynidae, but in my opinion it must be transferred outside Amaurobioidea.

Arushina Caporiacco 1947, Ann. Mus. Nat. Hungar. 40: 3, 102: *A. dentichelis* Capor. 1947, ibid., 103 Pl. 1: 2 from East Africa (♂ Budapest). Described in Dictynidae, transferred here to Zodariidae. Most probably synonymous with *Hermippus*.

Asagena Sundevall 1830, Consp. Arachn., 19: *Phalangium phaleratum* Panzer 1801, Faun. Ins. Germ. 78 Pl. 21 from Germany (no types; ♂ described by SCHRANK 1803 sub *Aranea serratipes*, ♀ described by SUNDEVALL, *loc. cit.*; ♂♀ coll. PL). Described in Drassides, first listed by C. L. KOCH (1837) in Agelenidae, but transferred by him (C. L. KOCH (1851) to Theridiidae, and later always listed there. Synonymous with *Steatoda* (cf. LEVI 1957).

Asemotera Simon 1898, Hist. Nat. Araign. 2: 2, 260: *Erigone latithorax* Keys. 1886, Spinn. Amer., Theridiidae II 2: 2, 274 from Brasil (♂ Paris – not seen). The genotype was described in Theridiidae, but transferred to Agelenidae by SIMON (1894 a, p. 594), and selected as the type genus for subfamily Asemoterinae by KISHIDA (1955). The genus *Asemotera* was generally listed in Agelenidae until the revision by ROTH (1965), in which it was transferred to Linyphiidae: Erigoninae.

Astavakra n. gen., p. 393: *Uloborus sexmucronatus* Sim. 1893, Ann. Soc. Ent. France 62, 68 from the Philippine Islands (♀ Paris). Uloboridae: Uloborinae.

Asthenoctenus Simon 1897, Boll. Mus. Zool. Torino 12: 270, 7: *A. borellii* Sim. 1897, ibid. from Paraguay (♀ Paris; London). Originally assigned into Clubionidae: Cteninae, and later generally listed in Ctenidae: Cteninae. Listed here in Ctenidae: Acanthocteninae. Senior homonym of *Asthenoctenus* Arnold 1937.

A specific revision has not yet been carried out. *Acanthoctenus hingstoni* M.-Leit. 1948 (♀ type preservation unknown – ? paratypes London) = *Asthenoctenus hingstoni* n. comb.

Atelolathys Simon 1892, Hist. Nat. Araign. 1: 1, 243: *A. varia* Sim. 1892, ibid. from Ceylon (♀ Paris). Described in Dictynidae, listed here in subfamily Cicurinae. As the males of this genus are unknown, its status cannot be fixed. However, it is not closely related with the six-eyed species of *Lathys*.

Auchicybaeus Gertsch 1933, Amer. Mus. Novit. 637, 11: *A. ovalis* Gertsch 1933, ibid. f. 15 from Indiana (♀ New York – not seen) = *Meta menardii* (Latr.) 1804 (GERTSCH & IVIE 1936). Described in Agelenidae: Cybaeinae, and listed still there by ROEWER (1954 a). Synonymous with *Meta* (Araneidae: Metinae).

Austrochilus Gertsch & Zapfe 1953, Invest. Zool. Chilen. 1: 10, 10: *A. manni* Gertsch & Zapfe 1955, in ZAPFE: Trab. Lab. Zool. Univ. Chile 2, 47 from Chile (♂♀ New York; juv. ♀ Santiago) = *Thaida peculiaris* Karsch 1880, Zeitschr. ges. Naturw. 53, 389 Pl. 12: 14 from Chile (♂ originally Berlin – now lost; ♀ det. PL: Berlin & Hamburg), n. syn. Originally assigned to Hypochilidae, listed here in Thaididae. Synonymous with *Thaida*, n. syn.

Austrohahnia Mello-Leitão 1942, Rev. Mus. La Plata, N.S. 2, Zool. 16, 424: *A. praestans* M.-Leit. 1942, ibid. f. 56 from Argentina (♀ La Plata – not available). Described in Hahniidae, listed here in Cybaeolinae, and it may even be synonymous with *Cybaeolus*.

Auximella Strand 1908, Jahrb. Nassau. Ver. Nat. 61, 224: *A. typica* Str. 1908, ibid. from Peru (♀ Wiesbaden; det PL: Hamburg). Described in Amaurobiidae, transferred here to Amaurobiidae: Macrobulinae. *Notolathys* is a probable synonym of this genus.

Auximus harpagulus Sim. 1906 (♂♀ Paris) = *Auximella harpagula* n. comb., *Auximus productus* Chamb. 1916 (♀ Cambridge) = *Auximella producta* n. comb.

The preservation of type material of all three species of *Notolathys* (*N. subdifficile* (M.-Leit.) 1919: ♀, *N. minensis* M.-Leit. 1926: ♀ & *N. spinosus* M.-Leit. 1926: ♂) is unknown at present, and their status remains obscure. There is also an undescribed species (♀ Paris).

Auximus Simon 1892, Hist. Nat. Araign. 1: 1, 239: *Amaurobius dentichelis* Sim. 1883, Ann. Soc. Ent. France, 6. Ser. 3, 268 Pl. 8: 3 – 4 from Azores (♂♀ Paris). Described in Dictynidae, but generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Listed here in Dictynidae: Cicurinae; synonymous with *Lathys*.

See also *Anisacate*, *Auximella*, *Callobius*, *Emblina*, *Goeldia*, *Malaika*, *Matundua*, *Metaltella*, *Retiro*, and *Vidole*. The fossil species *A. fossilis* Petr. 1950 and *A. succini* Petr. 1942 evidently represent undescribed genera, too, but I have not described them here because of insufficient knowledge. The status of *Auximus sindi* Capor. 1934 also remains obscure, and its type material is probably lost.

Avella O. Pickard-Cambridge 1877, Proc. Zool. Soc. London 1877, 574: *A. despiciens* O. P.-Cambr. 1877, ibid. Pl. 57: 10 from Australia (♀ Oxford; London). Described and generally listed in Dinopidae, but sometimes listed in Uloboridae: Dinopinae since SIMON (1892 a). The species of this well defined genus have been catalogued in *Menneus* both by ROEWER (1954 a) and BONNET (1955).

The specific revision of this genus has not been completed, but the generic affiliation of the following species has been confirmed: *M. trinodosus* Rainb. 1920 (♀ Adelaide) = *A. trinodosa* n. comb., *Dinopis insularis* Rainb. 1920 (♂ Adelaide) = *A. insularis* n. comb., *A. angulata* L. Koch 1878 (♀ carapace only: Hamburg), and *A. superciliosa* Thor. 1881 (♀ Genoa).

Avellopsis Purcell 1904, Trans. S. Afr. Phil. Soc. 15: 3, 128: *A. capensis* Purc. 1904, ibid. from South Africa (♂♀ Cape Town). Originally assigned into Uloboridae and later always listed there, but transferred here to Dinopidae, rather closely related to *Dinopis*.

Aviola Simon 1898, Hist. Nat. Araign. 2: 2, 275: *A. stenura* Sim. 1898, ibid. f. 276 & 280 from Ceylon (♂♀ Paris). Originally assigned to Agelenidae: Hahniinae, later generally listed

in Hahniidae. See *Alistra*; *Aviola* is here synonymized with that genus.

Aymarella Chamberlin 1916, Bull. Mus. Comp. Zool. Harvard 60: 6, 209: *A. munda* Chamb. 1916, *ibid.* Pl. 9: 1 – 5 from Peru (♀ Cambridge). For the synonyms of the generotype, see *Goeldia*. Described in Amaurobiidae, transferred here to Titanoecidae, and synonymized with *Goeldia*, n. syn.

Badumna Thorell 1890, Ann. Mus. Civ. Genova 28, 322: *B. hirsuta* Thor. 1890, *ibid.*, 323 from Java (♀♀ – juvv. syntypes in Genoa – Stockholm); ♂ described by KULCZYNSKI 1908: Warsaw). Described in Amaurobiidae, transferred here to Amaurobiidae Matachiinae. Synonyms *Aphyctoschaema*, *Derxema*, *Hesperauximus*, and *Ixeuticus*, all n. syn. However, *Aphyctoschaema* and *Ixeuticus* could be regarded as subgenera. Cf. also DONDALE (1966).

Subgenus *Badumna* s. str.: *Amaurobius pilosus* Hogg 1900 (♂ London; det. PL: Warsaw) = *Badumna varia* Sim. 1906 (♀ Paris), n. syn. = *B. pilosa* n. comb. The status of *B. exilis* Thor. 1890 (juv., non ♂ Genoa) is obscure, but it may be synonymous with the generotype.

Subgenus *Aphyctoschaema* (synon. *Derxema*):

B. hygrophila Sim. 1902 (♂♀ Paris), *A. guttipes* Sim. 1906 (♀ Paris) = *A. sedula* Sim. (♀ Paris) n. syn. = *B. guttipes* n. comb., *Derxema arguta* Sim. 1906 = *B. arguta* n. comb., *A. maculata* Rainb. 1916 (♀ Sydney) = *B. maculata* n. comb.

Subgenus *Ixeuticus* (synon. *Hesperauximus*): There is considerable variation in size and colouration even within a single population of the species of this group, and it is impossible to make a final specific revision on the basis of the scarce material available in European collections. The following new synonymies seem to be the most probable, although the possibility of existence of sibling species in this group cannot be excluded.

Amaurobius scalaris L. Koch 1872 (♀ Hamburg; det PL: Brisbane & Berlin).

Amaurobius longinquus L. Koch 1867 (♀ Wien; Stockholm, Berlin, det PL: Warsaw & Brisbane) = *A. senilis* L. Koch 1872 (♀ Hamburg – Berlin, Stockholm, Berlin, Vienna, Paris) = *A. chalybeius* L. Koch 1872 (♀ Hamburg; ♂♀ Paris, juv. Stockholm) = *A. silvanus* L. Koch (♀ Hamburg; Frankfurt) = *A. martius* Sim. 1899 (♂♀ Paris; New York, Vienna, Dunedin) = *B. longinquus* n. comb.

Amaurobius insignis L. Koch 1872 (♀ syntypes ? Berlin – Stockholm; det PL: Osaka & Brisbane) = *A. robustus* L. Koch 1872 (♀ Hamburg – Berlin; Vienna, Berlin & Warsaw) = *A. praecalvus* Sim. 1906 (♂♀ Paris) = *A. australiensis* Strand 1913 (♀ Frankfurt) = *B. insignis* n. comb.

Amaurobius microps Sim. 1908 (Syntypes ♀♀ Paris – Hamburg – Berlin) = *B. microps* n. comb., *Amaurobius socialis* Rainb. 1905 (♀ Sydney) = *B. socialis* n. comb.

There are at least two underscribed species (♂♀ coll. HICKMAN). *Clubiona saeva* Walck. 1837 (no types) is a syn-

onym of either *B. longinquus* or *B. insignis*, but it must be regarded as a nomen dubium (cf. ROEWER 1954 a, p. 1448).

Baeriella Simon 1903, Ann. Soc. Ent. France 72, Bull., 272: *B. myrmecophila* Sim. 1903, *ibid.*, f. A-C from the Argentine (♀ Paris). Originally assigned to Drassidae: Cybaeodinae, but sometimes listed in Clubionidae: Liocraninae since PETRUNKEVITCH (1928). Transferred here to Corinnidae. Senior homonym of *Baeriella* Fuhrmann 1932.

Baiami n. gen., p. 330; *Epimecinus volucris* Sim. 1908, Fauna SW-Austr. 1: 12, 377 from Western Australia (♀ Paris; Berlin). The generotype was described in Dictynidae, but the new genus is assigned to Amaurobiidae: Stiphidiinae, being, however, an aberrant genus.

Aphyctoschaema storeniformis Sim. 1908 (♀ Paris) = *B. storeniformis* n. comb., *Epimecinus tegearioides* Sim. 1908 (subad. ♀♀ ? syntypes Paris – Berlin) = *B. tegearioides* n. comb., *E. magnus* Berl. 1924 (♂♀ Paris) = *E. longipes* Berl. 1924 (♀ Paris), n. syn. = *B. magnus* n. comb.

Banaidja n. gen., p. 361: *Dictyna bifasciata* L. Koch 1872, Arachn. Austr. 1: 1, 323 Pl. 26: 1 from the Samoa Islands, Polynesia (♂ Hamburg; ♀ described by BERLAND 1929: London). Dictynidae: Dictyninae.

Bansaia Uyemura 1938, Acta Arachnol. 3: 4, 136: *B. nipponica* Uyem. 1938, *ibid.* from Japan (type preservation unknown). According to YAGINUMA (1962 a) synonymous with *Cybaeus* (here Dictynidae: Cybaeinae).

Barrisca Chamberlin & Ivie 1936, Bull. Univ. Utah, Biol. 27: 5, 15: *B. nannella* Chamb. & Iv. 1936, *ibid.* Pl. 4: 28 – 32 from Panama (♂ New York). Described in Agelenidae, transferred to Pisauridae: Rhoicininae by ROTH (1965). Listed here with some doubts in Amaurobiidae: Rhoicininae.

Barronopsis Chamberlin & Ivie 1941, as a subgenus of *Agelenopsis*, Ann. Ent. Soc. Amer. 35, 601: *Agelena barrowsi* Gertsch 1934, Amer. Mus. Novit., 726, 23 f. 8 – 9 from Florida (♂♀ New York). Agelenidae: Ageleninae. New status is proposed here for this taxon.

The species of this genus have been revised by ROTH (1954), comprising a subgenus of *Agelenopsis*.

Benoitia n. gen., p. 337: *Agelena bornemiszae* Capor. 1947, Ann. Mus. Nat. Hungar. 40: 3, 107 from Kenya (♀ Budapest – not seen; ♂ described by ROEWER 1954 b; ♂♀ det. PL: Tervuren). Agelenidae: Ageleninae.

The following species are transferred to this genus, but their status remains obscure: *A. rhodesiae* Poc. 1901 (♀ London) = *B. rhodesiae* n. comb., *A. raymondiae* Less. 1915 (Geneva – not seen) = *B. raymondiae* n. comb., and *A. upembana* Roew. 1954 (♂♀ presumably Frankfurt) = *B. upembana* n. comb.

Bigois Simon 1898, Hist. Nat. Araign. 2: 2, 277: *B. myops* Sim. 1898, ibid. f. 275 from the Philippine Islands (♀ Paris). Described in Agelelidae: Hahniinae. Cf. *Alistra*, which is a senior synonym of this genus.

Numerous species of Hahniidae have been assigned to this genus only because of minute anterior median eyes. See *Amaloxenops*, *Intiluatana*, and *Neohahnia*.

Blabomma Chamberlin & Ivie 1937, Ann. Ent. Soc. Amer. 30: 2, 219: *B. grandis* Chamb. & Iv. 1937, ibid. Pl. 5: 34 – 39 from British Columbia (♂♀ New York). Described in Agelenidae, listed in subfamily Ageleninae by ROEWER (1954 a). Listed here in Dictynidae: Cicuriniinae. Synonym: *Chorizommoides*.

The species of this genus have been figured by CHAMBERLIN & IVIE (1937) under *Blabomma* and *Chorizommoides*. Material of *Chorizomma californica* Sim. 1895 (♂ Paris; ♀ described by CHAMBERLIN & IVIE 1937; ♀♂ Portal) examined.

Boroamia Kishida 1929, in YUHARA: Kumo no Kenkyu, 216: *B. psechroides* Kishida 1929, (ibid. + Fig.), from Japan (no types). According to YAGINUMA (in litt.), this species seems to be synonymous with *Titanoea nipponica* Yagin. (see *Nurscia*). KISHIDA (1930) listed this genus in Psechridae with only a Japanese name in parentheses, but without any description or even any named species. Thus *Boroamia* Kishida 1930 is here regarded as a nomen nudum. This genus is here synonymized with *Nurscia*, and listed in Titanoeidae.

Brachyanillus Simon 1913, Arch. Zool. Expér. Gén. 52: 5, 378: *B. lioceraninus* Sim. 1913, ibid. from Spain (juv. ♀ Paris). Described in Clubionidae: Lioceraninae. The placing of this genus remains obscure, as there are no adult specimens, but most probably it is not a representative of Amaurobioidea.

Brigittea n. gen., p. 350: *Aranea latens* Fabr. 1775, Syst. Ent., 432 (no types; ♀ described by C. L. KOCH 1836 sub *Dictyna latens*, ♂ by WALCKENAER 1841 sub *Theridion latens*; coll. PL, Stockholm & Warsaw) = *Dictyna mandibulosa* Can. & Pav. 1869, Atti Soc. Ital. Sci. Nat. 11, 861 from Italy (♂ Genoa), n. syn. = *D. puta* O. P.-Cambr. 1872, Proc. Zool. Soc. London, 261 from Syria (juv. ♀, non ♂ Oxford),

n. syn. = *D. koziorowiczi* Sim. 1873, Mém. Soc. Sci. Liège, 2. Ser. 5, 330 from Algeria (♂♀ Paris), n. syn. = *D. varians* Spassky 1952, Entomol. Obozr. 32, 202 f. 4 from Tadzikistan (♀ type preservation unknown), n. syn. Dictynidae: Dictyninae, most closely related to *Archaeodictyna* and *Marilynia*.

D. vicina Sim. 1873 (♂♀ Paris; Budapest & Stockholm) = *D. innocens*: O. PICKARD-CAMBRIDGE 1876 b (♂ Oxford), non O. P.-Cambr. 1872 (♀), n. syn. = *B. vicina* n. comb., *Theridion civicum* Lucas 1850 (♀ no types; Paris & Stockholm) = *B. civica* n. comb., *D. innocens* O. P.-Cambr. 1872 (♀ Oxford; det PL: Warsaw) = *D. aharonii* Str. 1914 (♀ Frankfurt), n. syn. = *D. jacksoni* Brist. 1935 (♀ type preservation unknown), n. syn. = *B. innocens* n. comb., *D. turbida* Sim. 1905 (♀ Paris – syntypes: in part; Geneva) = *D. kandiana* Sim. 1906 (♀ Paris) = *B. turbida* n. comb., *D. tullgreni* Capor. 1949 (♂ type preservation unknown) = *B. tullgreni* n. comb., *D. bifida* Denis 1955 (♂♀ Paris), non *D. bifida* Jones 1947, = *B. denisi* n. nov., and *D. umai* Tikad. 1965 (♂♀ Calcutta) = *B. umai* n. comb.

D. colona Sim. 1906 (♀ Paris) may belong to the vicinity of *Brigittea*, at least, although it may represent a new genus as well.

Brommella Tullgren 1948, Ent. Tidskr. 69, 156: *B. notabilis* Tullg. 1948, ibid. f. 1 A-E from Sweden (♂ Stockholm; ♂♀ Brno) = *Lathys falcigera* Balogh 1935 Sash. Pókfaun., 12 from Hungary (♂♀ Budapest – not seen), synonymy independently established also by THALER (in BRAUN 1964). Described in Dictynidae, listed here in subfamily Cicuriniinae. Synonyms *Lathargenna* and *Pagomys* Chamberlin 1948.

The Nearctic species of this genus have been revised by CHAMBERLIN & GERTSCH (1958) under the generic name *Pagomys*.

Material of *Argenna monticola* Gertsch & Ivie 1936 (♀ New York; ♂ described by CHAMBERLIN 1948 sub *P. uinta*; ♂♀ New York) examined.

Lathys (Scololathys) punctosparsus Oi 1957 (♀ Osaka I – ♀ identified by Oi examined, ♂ described by Oi 1961) = *B. punctosparsa* n. comb. Oi (in litt.) independently suggested that this species may belong to *Pagomys*. In my opinion it represents a fairly deviating type which is evidently worthy of a different subgenus.

Calacadia Exline 1960, Proc. Calif. Acad. Sci., 4. Ser. 29: 17, 601: *C. chilensis* Exl. 1960, ibid., 602 f. 16, 22 – 23, 25 – 26, 28 – 30 from Chile (♂♀ San Francisco). Described in Pisauridae: Rhoicininae, transferred here to Amaurobiidae: Metaltellinae.

I have not seen material of other species described by EXLINE (1960), but it is evident that they are partly synonymous with the species that were transferred to this genus by EXLINE (op. cit.) without examination of the corresponding type material. I suppose that the species described up to date represent only three different species. *Rubrius*

radulifer Sim. 1902 (♀ Paris – ♂ det. PL) is possibly synonymous with *C. rossi* Exl. 1960, while *C. coquimbensis* Exl. 1960 is certainly synonymous with *Mynthes dentifer* Tullg. 1902 (♂ Stockholm), and also *C. osorno* Exl. 1960 may be conspecific with them. The status of *Clubiona ambigua* Nic. 1849 (no types) remains obscure although a synonymy with the generotype seems to be the most probable alternative.

Calamistrula F. Dahl 1901, Sitz.-Ber. Ges. Naturf. Fr. Berlin 9, 186: *C. evanescens* Dahl 1901, *ibid.*, 195 f. 1 – 5 from Madagascar (♀ Berlin). Described in Zoropsidae, transferred to Tenggellidae by F. DAHL (1908), and selected as the type genus for the subfamily Calamistrulinae by PETRUNKEVITCH (1928). Listed here provisionally as a deviating genus of Miturgidae: Uliodoninae. The name Calamistrulinae has priority over Uliodoninae, but it is not recommendable in this case.

Calilena Chamberlin & Ivie 1941, Ann. Ent. Soc. Amer. 34: 3, 603: *C. saylora* Chamb. & Iv. 1941, *ibid.*, 608 f. 53 & 69 from California (♂♀ New York). Described in Agelenidae (Ageleninae); generally listed in subfamily Ageleninae.

The species of this genus have been revised by CHAMBERLIN & IVIE (1941). Material of *C. restricta* Chamb. & Iv. 1941 (♂♀ New York) also examined by me.

Calleva Simon 1892, Hist. Nat. Araign. 1: 1, 329: *C. paupercula* Sim. 1892, *ibid.* from the Argentine (subad. ♀ Paris) = *Amaurobius patellaris* Sim. 1893, Ann. Soc. Ent. Fr. 61, 434 Pl. 9:8 from Venezuela (♂♀ Paris) n. syn. (cf. *Goeldia*). Described in Dictynidae, listed in Amaurobiidae since PETRUNKEVITCH (1928). Transferred here to Titanocidae; synonymous with *Goeldia*, n. syn.

Callevophthalmus Simon 1906, Ann. Soc. Ent. Belg. 50, 303: *Lathys alba* Keys. 1890, Arachn. Austr. 2, 250 Pl. 23: 2 from New South Wales, Australia (♀ London; ♂♀ det PL: Warsaw & Berlin) = *C. lividus* Sim. 1908, Fauna SW-Austr. 1: 12, 378 from Western Australia (♂ Paris), n. syn. Originally described in Dictynidae, but since PETRUNKEVITCH (1928) always listed in Amaurobiidae. Transferred here back to Dictynidae: Dictyninae.

The following species are also assigned to this genus:

Lathys maculatus Keys. 1890 (♀ London; Berlin & Warsaw), *Matachia rufostlata* Chamberlain 1946 (♂♀ Auckland – not seen) = *C. rufostlatus* n. comb. (cf. B. MARPLES 1962).

Callevopsis Tullgren 1902, Bih. Sv. Vet. Ak. Handl. 28: 4, 7: *C. striata* Tullg. 1902, *ibid.* Pl. 1: 1 from southern Chile (♀ Stockholm; det. PL:

Santiago). Described in Dictynidae and later generally listed in Amaurobiidae. Listed here as Amaurobioidea incertae sedis.

Callioplus Bishop & Crosby 1935, Proc. Biol. Soc. Washington 48, 45: *Amaurobius hoplites* Bish. & Cr. 1926, J. Elisha Mitchell Sci. Soc. 41: 3 – 4, 171 Pl. 21: 12 – 13 from North Carolina (♂♀ Cambridge). Amaurobiidae: Amaurobiinae. Synonyms: *Alauximus*, n. syn. and *Cybaeopsis* n. syn.

The Nearctic species of *Callioplus* have been revised by BISHOP & CROSBY (1935) and CHAMBERLIN (1947). For the species here transferred to this genus, see *Alauximus* and *Cybaeopsis*.

Callobius Chamberlin 1947, Bull. Univ. Utah 38: 8, Biol. 10: 5, 6: *Ciniflo bennetti* Bl. 1848, Ann. Mag. Nat. Hist., 1 Ser. 17, 41 from Ontario, Canada (♀ presumably in Oxford; ♂ described by EMERTON 1888; ♂♀ Helsinki, Paris & New York). Amaurobiidae: Amaurobiinae.

The Nearctic species of this genus have been figured in detail by CHAMBERLIN & IVIE (1947 a), but I cannot agree with their limitation of species. However, the patterns of the geographic variation in this group seem to be rather complicated, and no attempt is made here to prove the final status of most of the species of CHAMBERLIN & IVIE (1947 a). I have personally investigated only material of *Amaurobius nevadensis* Sim. 1884 (♂♀ Paris), *A. severus* Sim. 1884 (♂♀ Paris), and *Clubiona claustraria* Hahn 1831 (♂♀ Stockholm, Berlin, Helsinki, Paris, Warsaw & coll. K. Thaler; figures by YAGINUMA in litt.) = *Callobius claustrarius* n. comb. Thus a preliminary list of species only is presented here. The names in brackets refer to species whose status must be checked, because they are probably only subspecies of the listed species.

C. claustrarius (Hahn) 1831 [*C. bennetti* (Bl.) 1848, *C. nevadensis* (Sim.) 1884, *C. nomeus* (Chamb.) 1919, *C. claustrarius balcanicus* (Drenski) 1940, *C. angelus* (Chamb. & Iv.) 1947, *C. canada* (Chamb. & Iv.) 1947, *C. catalinus* (Chamb. & Iv.) 1947, *C. enus* (Chamb. & Iv.) 1947, *C. shastus* (Chamb. & Iv.) 1947, *C. subnomeus* (Chamb. & Iv.) 1947 & *C. tacoma* (Chamb. & Iv.) 1947 n. comb.] (cf. ROEWER 1954 a, p. 1359 & 1364 – 1366).

C. severus (Sim.) 1884 [*C. arizonicus* (Chamb. & Iv.) 1947, *C. deces* (Chamb. & Iv.) 1947 & *C. melanus* (Chamb. & Iv.) 1947], *C. olympus* (Chamb. & Iv.) 1947, *C. tamarus* (Chamb. & Iv.) 1947, *C. kamelus* (Chamb. & Iv.) 1947, *C. pictus* (Chamb. & Iv.) 1947, and *C. alaskanus* (Chamb. & Iv.) 1947.

Caloctenus Keyserling 1876, Verh. Zool. Bot. Ges. Wien 26, 697: *C. aculeatus* Keys. 1876, *ibid.* Pl. 8: 59 from Colombia (♀ type preservation unknown). Described in Ctenoidae, and selected as the type genus for Calocteninae by PETRUNKEVITCH (1928). Listed here in Ctenidae: Acanthocteninae.

A complete specific revision has not yet been carried out, but all the Neotropical species examined up to date seem to be congeneric with the generotype (*C. penicilliger* Sim. 1897: ♂♀ Paris; London, *C. gracilitarsis* Sim. 1896: ♂♀ Paris, *C. luteovittatus* Sim. 1897: ♀ Paris, and *C. spp. indet.*: Berlin, Hamburg & Paris). On the other hand, the Ethiopian species may belong to other Ctenid genera. The only Oriental species, *C. celer* Sim. 1896 (♂♀ Paris) that has been examined by myself, seems to be related or even to belong to *Acantheis*.

Calymmaria Chamberlin & Ivie 1937, Ann. Ent. Soc. Amer. 30: 2, 211: *C. monicae* Chamb. & Iv. 1937, *ibid.*, 213 Pl. 1: 1 – 3 & 3: 16 – 17 from California (♂♀ New York). Described in Agelenidae, listed in subfamily Ageleninae, e.g., by ROEWER (1954 a). Transferred here to Hahniidae: Cryphoeicinae; most closely related to *Dirksia*.

A specific revision of this genus has been presented by CHAMBERLIN & IVIE (1937). I have examined material of *C. emertoni* (Sim.) 1897 (♂♀ Portal).

Cambridgea L. Koch 1872, Arachn. Austr. 1: 1, 359: *C. fasciata* L. Koch 1872, *ibid.* Pl. 28: 2 from New Zealand (♀ type preservation unknown) = *Tegenaria antipodiana* White 1849, Proc. Zool. Soc. London, 5 from New Zealand (♂ no types; ♂♀ Paris). Described in Agelenidae, sometimes listed in subfamily Cybaeinae (PETRUNKEVITCH 1928, BONNET 1959) sometimes in family Argyronetidae (ROEWER 1954 a). Transferred here to Amaurobiidae: Desinae.

Tegenaria foliata L. Koch 1872 (♂♀ Berlin; London; Paris ♂ Vienna) is also included in this genus, while the status of *C. pilosa* Bryant 1935 (♀ Christchurch – not seen) and *C. simoni* Berl. 1924 (♀ type preservation unknown) remains obscure to me.

Campostichomma Karsch 1891, Berl. Ent. Zeitschr. 36: 2, 295: *C. manicatum* Karsch 1891, *ibid.*, 296 Pl. 12: 19 from Ceylon (♀ Berlin; ♂ described by SIMON 1898 b: ♂♀ Paris). Described in Agelenidae, generally listed in subfamily Cybaeinae since PETRUNKEVITCH (1928). Transferred here to Miturgidae: Machadoniinae. The limitation of this genus is radically changed here.

See also *Devendra* and *Machadonia*.

Campostichommides Strand 1911, Abh. Senck. Ges. 34: 2, 164: *C. inquirendus* Str. 1911, *ibid.* Pl. 5: 67 from island Kei, Indonesia (juv. ♀ Frankfurt). Orthography corrected to *inquirendum* by BONNET (1956, p. 947). Described in Agelenidae, transferred here to Pisauridae, but the probable synonymy with the known genera remains open.

Cavator Blackwall 1841, Ann. Mag. Nat. Hist., 1 Ser. 6, 229: *Clubiona saxatilis* Bl. 1833, Lond.

Phil. Mag. Journ. Sci., 3. Ser. 3, 436 from England (♂♀ presumably no types). For the complicated synonymy of this species, see CHRYSANTHUS (1965). The description of *Cavator* was included in the report of a meeting, and also independently published in the year 1848 (not 1841 as generally catalogued) in Proc. Linn. Soc. London 1840, 66. However, the facts presented at the corresponding meeting were first published in Trans. Linn. Soc. London, Zool. 18, p. 618, but there the name *Cavator* had been changed to *Coelotes*. In spite of these facts, the names proposed at the meeting were later published as such; according to the current rules of nomenclature the name *Coelotes* is valid and thus also a senior synonym of *Cavator*. Cf. also LEVI & KRAUS (1964), where it was proposed to add *Cavator* to the list of officially rejected names. Described in Drassidae, later generally listed in Agelenidae: Ageleninae. Listed here in Agelenidae: Coelotinae.

Cedicus Simon 1875, Arachn. France 2, 48: *C. flavipes* Sim. 1875, *ibid.* Pl. 5: 15 from Corsica (♂♀ Paris: Stockholm). Described in Agelenidae, generally listed in the subfamily Cybaeinae since PETRUNKEVITCH (1928), but in Argyronetidae by KISHIDA (1955). Transferred here into Amaurobiidae: Desinae.

The specific revision is not yet completed. *C. maerens* Sim. 1889 (♀ Paris) and *C. bucculentus* Sim. 1889 (♀ Paris) certainly belong here, as probably does also *C. pavlovskyi* Spassky 1941 (♂ type preservation unknown). Besides, there is an undescribed species from India (♀ Helsinki). *C. pumilus* Thor. 1896 (♀ London) is transferred here outside the groups treated, but the familial affiliation of this tiny two-clawed species remains puzzling. The status of *C. dubius* Str. 1907 (♀ type preservation unknown) is obscure, but evidently it does not belong here. See also *Coelotes*.

Celaetycheus Simon 1897, Hist. Nat. Araign. 2: 1, 115: *C. flavostriatus* Sim. 1897, *ibid.* f. 104 – 105 from Brasil (♀ Paris). Described in Clubionidae: Cteninae, Ctenaeae, and later generally listed in Ctenidae: Cteninae. Listed here as Ctenidae incertae sedis.

C. paradoxus F. O. P.-Cambr. 1900 (♂ London) is congeneric with the generotype, but the status of the other species described has not been checked.

Centroctenus Mello-Leitão 1929, Ann. Ac. Bras. Ci. 1: 2, 99: *C. longimanus* M.-Leit. 1929, *ibid.* f. 9 – 10 from Brasil (♂ type preservation unknown). Described in Ctenidae, assigned to Argocteninae by MELLO-LEITÃO (1936 b), but later listed in Cteninae by ROEWER (1954 a).

Listed here in Acanthotheninae; it seems to be related to *Anahita*.

Ctenus ocelliventer Strand 1909 (♂ Berlin; ♀ described by MELLO-LEITÃO (*op. cit.*) = *C. ocelliventer* n. comb. This species may even be congeneric with the generotype.

Centropelma L. Koch 1872, Arachn. Austr. 1, 246: *C. bicolor* L. Koch 1872, *ibid.* Pl. 20: 5–6 from New Guinea (types originally in Stuttgart – destroyed). Junior homonym of *Centropelma* Sclater & Salvin 1869. Synonymous with *Nicodamus* (see this genus).

Cerrutia Roewer 1960, *Fragm. Entomol.* 3: 5, 88: *C. molaria* Roew. 1960, *ibid.*, f. 1 from Sicily (♂♀ type preservation unknown). Originally assigned into Clubionidae: Liocraninae, Liocraneae, but transferred here to Gnaphosidae; it is rather closely related to *Micaria* (cf. also ROEWER *op. cit.*).

Chaerea Simon 1884, Bull. Soc. Zool. France 9, 323: *C. maritimus* Sim. 1884, *ibid.*, 324 from Cartagena, North Africa (♂♀ Paris). Described in Dictynidae, listed here in the subfamily Tricholathysinae.

†*Chalinura* Dalman 1826, K. Sv. Vet. Akad. Handl. 1825, 397: *C. longipes* Dalman 1826, *ibid.* from unknown region (no types). Before the creation of Hersiliidae (THORELL 1870 a), often included in Agelenidae. Junior synonym of *Hersilia* Savigny & Audouin 1825 (THORELL 1877), senior homonym of *Chalinura* Goode & Bean 1882.

Charitonowia Strand 1934, Folia Zool. Hydrobiol. 6: 2, 272: This name was proposed as a nomen novum for *Myropsis* Simon 1898, but only *Myro chilensis* Sim. 1888, Ann. Soc. Ent. France, 6. Ser. 8, 218 from Chile (♂ Paris) was listed in connection with the original publication of *Charitonowia*. However, there is no longer any problem concerning the generotype designation, as this genus is generally accepted as a junior synonym of *Macrobunus* (see this genus).

Chersis Savigny 1831, in LATREILLE: Cours d'Entomologie ou l'Histoire naturelle des Crustacés, des Arachnides, des Myriapodes et des Insectes, 542 as a novum novum for *Platyscelum* (see this genus). However, only the combination *C. gibullus* was originally cited (LATREILLE 1831, p. 390), seemingly referring to *Palpimanus gibullus* Dufour 1820 (see *Palpimanus*). Selected as the type genus of family Chersidae by CANESTRINI & PAVESI (1870). This family included also Cribellate genera while *Chersis* and its senior synonyme *Palpimanus* were sometimes included in Eresidae after C. L. Koch (1851), until the creation of the family Palpimanidae (Palpimanidae) by O. PICKARD-CAMBRIDGE (1871).

Chorizomma Simon 1872, Ann. Soc. Ent. France, 5. Ser. 2, 220: *C. subterranea* Sim. 1872, *ibid.*, 221 Pl. 12: 6–9 from France (♂♀ Paris). Synonymous with *Cicurina* (see this genus), but may be regarded as a subgenus of this (cf. CHAMBERLIN & IVIE 1942 b: 21).

See also *Ameromma*, *Blabomma*, and *Yorima*.

Chorizommoides Chamberlin & Ivie 1937, Ann. Ent. Soc. Amer. 30: 2, 218: *C. sylvicolus* California (♀ New York). Orthography corrected to *silvicola* by BONNET (1956, p. 1077). Described in Agelenidae, and later generally listed in the subfamily Ageleninae. Transferred here to Dictynidae: Cicurinae. ROTH (1956) included this genus in *Blabomma* as the first reviser. The description of *Chorizommoides* has page preference over that of *Blabomma*, although in the table of contents, which has page preference over both descriptions, the genera are listed in alphabetical order.

Chresiona Simon 1903, Ann. Soc. Ent. Belg. 47, 36: *C. nigrosignata* Sim. 1903, *ibid.* from South Africa (♀ Paris) = *C. albescens* Sim. 1903, *ibid.* from South Africa (♀ Paris), n. syn. Described in Agelenidae, and later generally listed in subfamily Cybaeinae since PETRUNKEVITCH (1928). Transferred here to Amaurobiidae: Macrobulinae.

C. convexa Sim. 1903 (♀ Paris) = *C. quadrilineata* Sim. 1903 (♀ Paris) n. syn. *Cybaeus invalidus* Sim. 1898 (♀ Paris) must be transferred to *Chresiona*, or at least to its vicinity.

Cicirra Simon 1886, Ann. Soc. Ent. Belg. 30, C. R., LXI: *C. decemnotata* Sim. 1886, *ibid.* from Tasmania (♀ Paris). Described in Agelenidae and generally listed in subfamily Ageleninae since PETRUNKEVITCH (1928). Transferred here to Amaurobiidae: Matachiinae, closely related to Cribellate *Forsterina*.

Cicurata Chamberlin & Ivie 1940, Bull. Univ. Utah 30: 18, Biol. 5: 9, 73 as a subgenus of *Cicurina*: *C. buwata* Chamb. & Iv. 1940, *ibid.*, 74 Pl. 12: 94 from Texas (juv. New York). See *Cicurina*.

Cicurella Chamberlin & Ivie 1940, Bull. Univ. Utah 30: 18, Biol. 5: 9, 74 Pl. 2: 11 as a subgenus of *Cicurina*: *C. microps* Chamb. & Iv. 1940, *ibid.*, 77 Pl. 8: 61–62 & 12: 91 from Texas (♂♀ New York). See *Cicurina* and *Tetrilus*.

Cicurina Menge 1871, Schrift. naturf. Ges. Danzig, N. F. 2, 271: *Aranea cicurea* Fabr. 1793, Ent. Syst. 2, 410 (no types; ♂♀ Paris). For orthographic and synonymic history of *C. cicur*, see BONNET (1949; 1956, p. 1088). Described in Agelenidae, and selected by F. O. PICKARD-CAMBRIDGE (1893) as the type genus of subfamily Cicurinae, and later independently by

KISHIDA (1955). By all other authors, it has been included in Ageleninae since SIMON (1898 a). See also the opinion of CHAMBERLIN & IVIE (1940, p. 6). Transferred here to Dictynidae: Cicurinae. *Chorizomma*, *Cicurata*, *Cicurella* (= *Tetrilus*), *Cicurona* and *Cicurusta* have been regarded as subgenera of *Cicurina* (s. lat.) by CHAMBERLIN & IVIE (1940) in their specific revision, where the subgenus *Cicurina* (s. str.) is also defined and limited (p. 22 Pl. 2: 8). *Moguracicurina* is an additional synonym of *Cicurina* s. lat.

See also *Macrobnus* and *Olybrius*.

Cicurona Chamberlin & Ivie 1940, Bull. Univ. Utah 30: 18, 42 Pl. 2: 9 as a subgenus of *Cicurina*: *C. idahoana* Chamb. 1919, Ann. Ent. Soc. Amer. 12, 258 Pl. 19: 10 from Idaho (♀ Cambridge; ♂ described by EXLINE 1936). See *Cicurina*.

Cicurusta Chamberlin & Ivie 1940, Bull. Univ. Utah 30: 18, 47 Pl. 2: 10 as a subgenus of *Cicurina*: *C. robusta* Sim. 1886, Ann. Ent. Soc. Belg., C. R. 30, XL from Colorado (♀ Paris; ♂ described by EXLINE 1936). See *Cicurina*.

Ciniflella Mello-Leitão 1921, Rev. Soc. Brasil. Sci. 4, 179: *C. lutea* M.-Leit. 1921, ibid. from Brazil (♀ type preservation unknown). ROEWER (1954, p. 1304) synonymized *Paraltelopsis luteus* (M.-Leit.) 1924 with *C. lutea*, obviously because of similar specific names. The justification of this procedure is not clear to me, although I agree with him concerning the generic synonymy of *Altelopsis* Mello-Leitão 1924 and of its objective synonym *Paraltelopsis* with *Ciniflella*. Described in Dictynidae, transferred here to Amaurobiidae: Metaltelinae.

Ciniflo Blackwall 1841, Trans. Linn. Soc. London 18, Zool., 607: *Aranea atrox* Geer 1778: For additional information about the genotype, see *Amaurobius* C. L. Koch 1937. Selected by BLACKWALL (*op. cit.*) as the type genus for Ciniflonidae. For the complicated synonymic history of *Ciniflo* and *Amaurobius*, see LEVI & KRAUS (1964).

See also *Argenna*, *Callobius*, *Lathys*, *Taira*, and *Titanoeca*.

Cithaeron O. Pickard-Cambridge 1872 Proc. Zool. Soc. London, 272: *C. praedonium* O. P.-Cambr. 1872, ibid., 273 from Syria (♀ Oxford). Described in Agelenidae, listed in

Drassidae: Cithaeroninae (SIMON 1893 a), Zodariidae: Cithaeroninae (PETRUNKEVITCH 1928, BONNET 1956), or Cithaeronidae, in superfamily Homalonychiformia (CAPORACCO 1938, ROEWER 1954 a). In my opinion, it undoubtedly belongs to superfamily Zodarioidea, although the final status of the corresponding group is not yet clarified. Synonym *Tephlea*.

Clotho Walckenaer 1809, in LATREILLE: Gen. Crust. Insect. 4, 370: *C. durandi* Walck. 1809, ibid. from France (no types; ♂♀ Stockholm & Budapest). Listed in Theridiidae by C. L. KOCH (1850). SIMON (1864) named one of his groups (families) according to this genus: Clothéiens. THORELL (1870 a) at last founded the family Urocteidae, in which it has since been listed. O. PICKARD-CAMBRIDGE (1872), however, listed it in Oecobiidae. Listed here in Oecobiidae: Urocteinae. Junior homonym of *Clotho* Faujas de Saint-Fond 1808, senior homonym of *Clotho* de Blainville 1824, *Clotho* Gray 1840, and *Clotho* Mulsant & Verreaux 1874. Objective synonym of *Uroctea* and *Iphinoe* (cf. these genera).

See also *Oecobius*. Representatives of *Prodidomus*, *Zimira*, and *Zodaron* have also been described under this generic name.

Cluilius Simon 1889, Ann. Soc. Ent. France, 6. Ser. 8, 220: *Clubiona elegans* Nic. in SIMON 1889, ibid. from Chile (♀ no types) = *Clubiona chilensis* Nic. 1849, in GAY: Hist. Fis. Polit. Chili 10: 3, 419 from Chile (♀ no types; ♂ described by SIMON 1904). For authorship of genotype, cf. also BONNET (1958, p. 3538). Described in Drassidae, listed in Clubionidae: Clubioninae since SIMON (1897), transferred here into Miturgidae: Eutichurinae. Regarded as a synonym of *Philisca* since SIMON (1897), final status somewhat obscure.

Coelotes Blackwall 1841, Trans. Linn. Soc. London. Zool. 18, 618. By original description, *Clubiona saxatilis* Bl. 1833 was selected as genotype. This species was generally regarded as a junior synonyme of *Drassus atropos* Walck. 1825, until CHRYSANTHUS (1965) worked out the most probable synonymy of the latter species. LEVI & KRAUS (1965) therefore proposed the stabilization of the current usage of the name *Coelotes atropos* for the genotype of *Coelotes*, and as the type material of *Drassus atropos* has been lost, they also fixed the neotype (♂ Paris; ♂♀ Berlin). They have also proposed that *Coelotes* should be included in the official list of valid generic names (LEVI & KRAUS 1964).

Coelotes was originally assigned to Drassidae, but it has generally been listed in Agelenidae since SIMON (1874). Selected by F. O. PICKARD-CAMBRIDGE (1893) as the type genus of subfamily Coelotinae, but usually listed in Ageleinae since SIMON (1898 a), although sometimes with doubts (CHAMBERLIN & IVIE 1940, p. 6). I agree with the opinion of F. O. PICKARD-CAMBRIDGE (*op. cit.*).

A detailed analysis of the species of the Eastern Palearctic reveals that there is no clear-cut difference between *Coelotes* and *Coras*, but a series of intermediate species does occur. Neither are there distinct gaps between the groups listed below, and the phylogeny of these groups has not yet been clarified.

Synonyms *Amaurobius* C. L. Koch 1836 (non 1837), *Cavator*, *Iwogumoa*, *Pireneitega*, *Tubilega*, and *Urobia*.

The specific revision of this large genus has become very difficult, as there are evidently some morphologically very close pairs of species, and yet the infraspecific variation of some species is considerable. Therefore only a few new synonymies have been listed here, although the presence of several additional ones is evident. See KULCZYNSKI (1906).

Group I (*inermis*): *Amaurobius inermis* L. Koch 1855 (♀♀ types – Berlin; ♂ described by L. KOCH 1868: ♂ types – Berlin; ♂♀ coll. Polenec), *C. gasperinii* Sim. 1891 (♂ type preservation unknown; ♀ described by KULCZYNSKI 1906 sub *Amaurobius gasperinii*), *C. anoplus* Kulcz. 1897 (♂♀ Budapest – not seen), *C. falciger* Kulcz. 1897 (♂♀ Budapest – not seen), *A. karlinskii* Kulcz. 1906 (♀ Budapest – not seen; ♂ described by KOLOSARY 1938), and *C. denisi* Sch. 1963 (♀ Paris). Probably only 2–3 species.

Group II (*insidiosus* = *Iwogumoa* = group B in *Coras* by MUMA 1946): *C. insidiosus* L. Koch 1878 (♂ type preservation unknown; ♀ described by BÖSENBERG & STRAND 1906 Frankfurt; det PL: Berlin & Paris) = *C. planeyi* Sim. 1880 (♂ Paris), n. syn., *C. spinivulva* Sim. 1880 (♀ type preservation unknown det PL: Berlin) = *Coelotes möllendorffi* BÖSENBERG & STRAND 1906: ♀ Paris, non *Cedicus möllendorffi* Karsch 1881, n. syn. (= *Coelotes micado* Str. 1907 as n. nov.) = *C. bidens* Capor. 1934 (♀ Florence – not seen), n. syn. = *C. gunnanensis* Sch. 1963 (♀ Paris), n. syn., *C. juvenilis* Keys. 1881 (♀ type preservation unknown; ♂ described sub *C. fidelis* by BANKS 1892 b), *C. montanus* Emert. 1889 (♂♀ New York; Helsinki), *Coras taugynus* Chamb. 1925 (♀ type preservation unknown; ♂ described by MUMA 1946: New York) = *Coelotes taugynus* n. comb. *Coras cavernarum* Barrows 1940 (♀ type preservation unknown) = *Coelotes cavernarum* n. comb., and *Coras tennesseensis* Muma 1946 (♂♀ New York – not seen) = *Coelotes tennesseensis* n. comb. There is also an undescribed species from Japan (♂ Berlin), unless this represents the male of *C. spinivulva*; YAGINUMA (1960) described the male of *C. micado*, but it might represent a species of the *atropos* group.

Group III (*davidi* – syn. *Urobia*): *C. davidi* Sch. 1963 (♀ Paris; det. PL: Berlin), *Tegenaria curta* Bös. & Str. 1906 (♀ Frankfurt – not seen; det. PL: Berlin) = *C. curtus* n. comb.,

Agelena ignota Bös. & Str. 1906 (♀ Frankfurt – not seen) = *C. ignota* n. comb., and *Urobia hexommata* Komatsu 1957 (♀ type preservation unknown) = *C. hexommatus* n. comb. There is also an undescribed species from Japan (♀ Berlin).

Group IV (*modestus*): *C. modestus* Sim. 1880 (♀ type preservation unknown) = *C. luctuosus*: BÖSENBERG & STRAND 1906 (♂♀ Berlin – in part?), non *C. luctuosus* L. Koch 1878, n. syn. = *Tegenaria corasina*: YAGINUMA 1960 (♀ Osaka II – not seen), n. syn. The following species is included in this group with some reservations: *Coelotes kulianganus* Chamb. 1919 (♀ presumably Washington) = *C. möllendorffi*: SCHENKEL 1963 (♂♀ Paris), non *Cedicus möllendorffi* Karsch 1881, n. syn.

Group V (*atropos*, synonym *Cavator* and *Pireneitega*) = *Coelotes* s. str.: numerous species have been described, and opinions as to their mutual synonymy are variable (cf. ROEWER 1954 a, pp. 53–60, BONNET 1956, pp. 1176–1188, and KULCZYNSKI 1906). In the list below, only such new synonymies have been separately listed which have been proved to be unambiguous. The species complexes are listed as arranged according to their mutual relationship.

1. *C. exitialis* L. Koch 1878 (♂♀ type preservation unknown; det PL: ♂ Berlin) = *Tegenaria muscicapa* Bös. & Str. 1906 (♂ Frankfurt – not seen), n. syn.

2. *pickardi* – *pastor* – *pseudoterrestris* – *poweri* – *major* complex. Probably two good species, which are named *C. pickardi* O. P.-Cambr. 1873 and *C. poweri* Sim. 1875.

3. *C. mediocris* Kulcz. 1887 (♂♀ type preservation unknown) = *C. zangherii* Capor. 1938 (♂ Forlì), n. syn.

4. *terrestris* – *solitarius* – *pabulator* – *microps* – *magnidentatus* complex (1–3 species). The oldest name is *Aranea terrestris* Wider 1834.

5. the generotype (*C. atropos*).

6. an undescribed species from Japan (♂♀ Berlin).

7. *segestriiformis* – *roschidus* – *atramentarius* – *leveillei* – *obesus* – *pyrenaicus* complex (1–2 species). The oldest name is *Drassus segestriiformis* Dufour 1820.

Group VI (*luctuosus*): *C. luctuosus* L. Koch 1878 (♂♀ type preservation unknown; det PL: Berlin & Paris) = *C. japonicus* Karsch 1879 (♀ Berlin), n. syn. = *Tegenaria corasides* Bös. & Str. 1906 (♂♀ Frankfurt – not seen – cf. YAGINUMA 1962 a) = *C. laticeps* Sch. 1936 (♀ Stockholm – non ♂; *Tamgrinia*), n. syn., *Cedicus möllendorffi* Karsch 1881 (♀ Berlin – cf. groups II & III) = *C. csikii* Kulcz. 1901 (♂ type preservation unknown), n. syn. = *C. luctuosus schensiensis* Sch. 1963 (♂ Paris – cf. SCHENKEL *op. cit.*, p. 293, footnote), n. syn., *C. munieri* Sim. 1880 (♂ Paris – not seen; ♀ described by KULCZYNSKI 1906), and *C. longispina* Kulcz. 1897 (♂♀ type preservation unknown).

There is also a third undescribed species from Japan (♀ Berlin), which, however, may represent a new genus as well, together with *Tegenaria pichoni* Sch. 1936 (♂♀ Stockholm). The Neotropical species *C. exaptus* Banks 1898 (♀ Cambridge) evidently represent a new genus in Miturgidae: Tengellinae. The rest of the species described cannot be placed with certainty or are unknown to me.

See also *Cicurina*, *Coras*, *Histopona*, *Mynthes*, *Rubrius*, *Tamgrinia*, *Tegenaria*, *Tuberta*, *Urobia*, and *Wadotes*.

Coenothele Simon 1909, C. R. Acad. Sci. Paris 148, 736: *C. gregalis* Sim. 1909, *ibid.* from

Mexico (♂♀ Paris). Dictynidae: Dictyninae. Synonymous with *Mallos*.

Coras Simon 1898, Hist. Nat. Araign. 2: 2, 258: *Tegenaria medicinalis* Hentz 1821, J. Philad. Acad. Nat. Sci. 2, 53 Pl. 5: 1 from North America (♂♀ no types; Helsinki, Paris & Portal). Described in Agelenidae: Ageleninae and generally considered to be a close relative of *Coelotes*. Thus transferred here to the subfamily Coelotinae.

A specific revision of this genus has been published by MUMA (1946). His group A corresponds to the genus *Coras* as it is limited here, while the group B is here transferred to *Coelotes*. Material of *Coelotes lamellosus* Keys. 1887 (♂♀ London; Portal) also examined.

Corasoides Butler 1929, Proc. Soc. Victoria 24: 1, 42: *C. australis* Butl. 1929, ibid. Pl. 1: 1 – 5 from Victoria, Australia (♂♀ Melbourne). Described in Agelenidae: Ageleninae, listed here in Amaurobiidae: Desinae.

Rubrius mandibularis Bryant 1935 (♀ Christchurch – not seen) = *C. mandibularis* n. comb.

Coreidon Mello-Leitão 1917, Arch. Escol. Sup. Agr. Med.-Vet. 1, 15: *C. tropicum* M.-Leit. 1917, ibid. from Brazil (♂ type preservation unknown). Described in Agelenidae, but most probably it does not belong to the families that are revised here.

Corinoctenus Mello-Leitão 1939, Physis 17, 140: *C. anomalostomus* M.-Leit. 1939, ibid., f. a – b from Brasil (♀ Buenos Aires – not seen). By original description this genus was selected as the type for the subfamily Corinocteninae in Ctenidae, but here it is listed in Cteninae.

Coryssiphus Simon 1903, Ann. Soc. Ent. Belg. 47, 31: *C. praeusta* Sim. 1903, ibid. from Capland (♂ Paris), selected by PETRUNKEVITCH (1928). This genus was originally described as a relative of *Mesiotelus* and *Scolina*, and thus it has been listed under Clubionidae: Liocraninae by all authors since PETRUNKEVITCH (op. cit.). Transferred here outside Amaurobioidea, but its position remains unknown.

Cryphoea Thorell 1870, N. Acta reg. Soc. Sci. Upsal., 3. Ser. 7, 120: *Tegenaria silvicola* C. L. Koch 1834, in HERRICH-SCHÄFFER: Deutschl. Ins. 125, Pl. 16 from Germany (no types; ♂♀ described by C. L. Koch 1845 sub *Hahn timer silvicola*, ♂♀ coll. PL). Described as a representative of Agelenidae: Ageleninae, and later always listed there, except that KISHIDA (1955) created the subfamily Cryphoecinae. Transferred here into Hahniidae: Cryphoecinae.

The generic affiliation of the following species has been checked by myself: *C. lichenum* L. Koch 1876 (♂♀ London; Paris), *C. carpathica* Herman 1879 (♂♀ type preservation

unknown; ♂♀ Paris), and *C. peckhami* Sim. 1898 (♀ Paris; Portal; ♂ described by EXLINE 1938). Besides, *C. montana* Emert. 1909 (♂♀ New York) certainly belongs here. See also *Dirksia* and *Tuberta*.

Ctenophthalmus Simon 1880, Ann. Soc. Ent. Belg. 23, C. R., 174: *C. lineatus* (see *Simonus*). Objective synonym of *Simonus*, but also that of the later name *Ctenomma*. Junior homonym of *Ctenophthalmus* Kolenati 1857, and *Ctenophthalmus* Milne-Edwards 1879 (= err. transcr. of *Coenophthalmus* Milne-Edwards 1879).

Ctenomma Thorell 1890, Ann. Mus. Civ. Genova 31, 131 as a nomen novum for *Ctenophthalmus* Simon 1880. BONNET (1956, p. 1271) considered *Ctenomma* as the valid name for this genus, but according to the current rules of nomenclature (ICZN 1964 § 56 a), *Simonea* Gervais 1844 is not a homonym of *Simonus* Ritsema 1881, and thus the latter name must be used. For familial affiliation, see *Simonus*.

Ctenopsis Schmidt 1954, Zeitschr. Angew. Entomol. 36; 420: *C. stellata* Schmidt 1954, ibid., f. 13 from Brazil (♀ Hamburg). Originally assigned into Ctenidae, listed here in subfamily Cteninae.

Ctenus Walckenaer 1805, Tabl. Aran., 18: *C. dubius* Walck. 1805, ibid. Pl. 3: 22 from Guiana (♂ no types – no material in recent collections). As in the case of the genus *Storena*, there is no material of the generotype, and all later references to it are based on the poor original description, or a similar later one by WALCKENAER (1837) himself. For a more detailed discussion of this problem, see p. 375. WALCKENAER did not use the concept of family in its current meaning, but as a subdivision of genus. C. L. KOCH assigned *Ctenus* first (1837) to Thomisides, but transferred it later to Lycosides (1850). KEYSERLING (1877) created the family Ctenidae, but SIMON (1897) regarded it first as only a subfamily of Clubionidae. Senior homonym of *Ctenus* Mabille 1906. Numerous synonyms have been presented for *Ctenus* Walck., but most of them are evidently based on insufficient or erroneous argumentation. The selection of a new generotype with known material is the only way to decide the ultimate stabilization of this genus (cf. BÜCHERL *et al.* 1964).

Several hundreds of species have been assigned to this genus, which has generally been regarded as world-wide, and regional revisions have been presented by F. O. PICKARD-

CAMBRIDGE (1898), DES ARTS (1912), GRAVELY (1931), MELLO-LEITÃO (1936 b), and HYATT (1954). I have personally examined material of numerous species (Stockholm, Paris, Hamburg, Berlin, London, and Helsinki), and it is evident that there are representatives of several genera; obviously most of them belong to Ctenid genera that have been already described.

Cupiennius Simon 1891, Bull. Soc. Zool. France 16, 109: *C. getazi* Sim. 1891, *ibid.*, 110 from Central America (♀ Paris; ♂♀ coll. PL) Originally assigned to Clubionidae: Cteninae. F. O. PICKARD-CAMBRIDGE (1901) transferred it to Pisauridae, and this opinion is later shared by STRAND (1910) and SCHMIDT (1954), while most authors have listed *Cupiennius* in Ctenidae: Cteninae since PETRUNKEVITCH (1928). Listed here in Ctenidae: Thalassinae. Cf. also the discussion by SCHMIDT (1954, p. 415) and S. LUCAS (1964).

This large Neotropical genus has never been revised in regard to its species. Material of *C. medius* Chamb. & Iv. 1936 (♀ type preservation unknown; ♂♀ New York) examined. Cf. also *Ancylometes*.

Cybaeina Chamberlin & Ivie 1932, Bull. Univ. Utah 23: 2, Biol. 2: 1, 28: *Cybaeus minutus* Banks 1906, Proc. Ent. Soc. Washington 7, 95 from Washington State (♀ type preservation unknown; ♂ described by CHAMBERLIN & IVIE 1932). Described in Agelenidae: Cybaeinae, listed here in Dictynidae: Cybaeinae.

The four species listed by ROEWER (1954 a, p. 86) certainly belong here. Material of *C. xantha* Chamb. & Iv. 1937 (♀ Portal) examined.

Cybaeodamus Mello-Leitão 1938, Rev. Mus. La Plata, N. S. 1: 4, 92: *C. ornatus* M.-Leit. 1938, *ibid.*, 93 f. 4–5 from the Argentine (♂♀ La Plata – ♀ Buenos Aires: compared by SCHIAPELLI & GERSCHMAN DE PIKELIN). Described in Agelenidae, independently transferred to Zodariidae also by ROTH (1965). Cf. also MELLO-LEITÃO (1941 a, p. 107).

Cybaeodes Simon 1878, Arachn. France 4, 206: *C. testaceus* Sim. 1878, *ibid.* Pl. 15: 2 from France (♀ Paris). Originally described in Drassidae s. lat., and selected by himself (SIMON 1893 a) as the type genus of Cybaeodinae. Sometimes listed in Clubionidae: Liocraninae since PETRUNKEVITCH (1928). Transferred here outside the groups treated, close to *Andromma*.

C. incerta Banks 1898 (♀ Cambridge) is not closely related to this genus.

Cybaeolus Simon 1884, Bull. Soc. Zool. France 9, 125: *C. pusillus* Sim. 1884, *ibid.* from Tierra del Fuego (♀ type presumably lost) = *Dictyna fuegiana* Sim. 1895, An. Mus. Buenos Aires 4, 168 from Tierra del Fuego (♀ Paris; ♂ described by SIMON 1904: Paris; juv. Hamburg), n. syn. = *Mevianes wilsoni* Sim. 1904,

Ann. Soc. Ent. Belg. 48, 111 from Chile (♀ Paris; ♂♀ Portal), n. syn. Described in Agelenidae, listed in subfamily Cybaeinae by SIMON (1898 a). Selected here as the type genus for the subfamily Cybaeolinae and transferred to Hahnidae. Synonym: *Mevianes*, n. syn. Cf. also *Austrohahnia*.

M. delfini Sim. 1904 (♀ Paris; det. PL: Hamburg & Santiago) = *C. delfini* n. comb. and *M. rastellus* Roth 1967 (♂♀ New York) = *C. rastellus* n. comb.

Cybaeomyro Kishida 1942, in KOMATSU: Acta Arachn. 7: 2, 67: *C. sanctus* Kish. 1942, *ibid.* from Japan (♀ type preservation unknown). Synonymized with *Cybaeus* and listed in Argynoretidae by YAGINUMA (1962 a). Dictynidae: Cybaeinae.

Cybaeopsis Strand 1907, Verh. naturf. Ges. Görlitz 25: 1, 50: *C. typicus* Str. 1907, *ibid.* f. 40 from Northern Japan (♂ originally Munich – destroyed). Described in Agelenidae, listed in subfamily Cybaeinae since PETRUNKEVITCH (1928), except by YAGINUMA (1962 a) in Argynoretidae. Transferred here to Amaurobiidae: Amaurobiinae. The colulus, as described by STRAND (*op. cit.*), is obviously the reduced cribellum of the male; the genital organs show relationship with *Calliopus euoplus* Bish. & Cr. 1935 from North America. Synonymized here with some doubts with *Calliopus*, n. syn.

Cybaeota Chamberlin & Ivie 1933, Bull. Univ. Utah 24: 5, Biol. 2: 3, 3: *Liocranum calcaratum* Emert. 1911, Trans. Conn. Acad. Sci. 16: 4, 402 Pl. 5: 4 from New England (♂♀ Cambridge). Described in Agelenidae: Cybaeinae; here Dictynidae: Cybaeinae.

The species of this genus have been well figured by CHAMBERLIN & IVIE (1937).

Cybaeozyga Chamberlin & Ivie 1937, Ann. Ent. Soc. Amer. 30: 2, 226: *C. heterops* Chamb. & Iv. 1937, *ibid.* Pl. 9: 66–67 from Oregon (♂ Salt Lake City – not seen; ♀ will be described by ROTH). Described in Agelenidae, listed by ROEWER (1954 a) in subfamily Cybaeinae; here Dictynidae: Cybaeinae.

Cybaeus L. Koch 1868, Abh. Nat. Ges. Nürnberg 4, 46: *Amaurobius tetricus* C. L. Koch 1839, Die Arachniden 6, 43 f. 462 (♀ no types; ♂ described by L. Koch 1855; Paris, coll. Polenec). Described in Agelenidae, selected as the type genus for subfamily Cybaeinae by

SIMON (1898 a), and transferred to Argyronetidae by YAGINUMA (1960). Listed here in Dictynidae: Cybaeinae. Synonyms *Bansaia*, *Cybaemyro*, *Namopsilus*, and *Parauzinus*.

ROEWER (1954 a, p. 88 – 92) correctly lists the Holarctic species of this genus, although some of these species may be synonymous with each other. Material of *C. angustiarum* L. Koch 1868 (♂ type preservation unknown; Paris), *C. signifer* Sim. 1886 (♂♀ Paris), and *C. reticulatus* Sim. 1886 (♂♀ Paris) examined. Besides, there is one Caucasian (CHARITONOW 1947) and numerous Japanese species that certainly belong to *Cybaeus*, but which were not known to ROEWER (*op. cit.*) or were described later (see UYEMURA 1938, KOMATSU 1961, 1963, and 1965; and YAGINUMA 1962 a and 1963 b).

Each of the species originally assigned to *Cybaeus* but deriving outside the Holarctic seems to represent undescribed genera. ROTH (in litt.) will select *C. invalidus* Sim. 1898 (♀ Paris) from South Africa as generotype of a new Agelenid genus. In my opinion, it must be transferred to Amaurobiidae together with *C. maculatus* Keys. 1877 (♀ London); Cf. *Chresiona* and *Rhoicinaria*. *C. signatus* Keys. 1882 (♀ presumably Warsaw) will probably also be transferred to the same family, or outside Agelenidae, at least.

Cycals Thorell 1877, Ann. Mus. Civ. Genova 10, 475; *C. cylindrata* Thor. 1877, *ibid.*, 476 from Celebes (♀ type preservation unknown). Described in Agelenidae, selected as the type genus for the family Cycalidae by THORELL (1890), but later generally included in Agelenidae: Cybaeinae since PETRUNKEVITCH (1928), except in Argyronetidae by KISHIDA (1930).

Transferred here outside the superfamily Amaurobioidea; most probably it belongs to Corinnidae.

The status of *Cycals gracilis* Karsch 1879 (type preservation unknown) is obscure; probably it is not congeneric with *C. cylindrata*.

Cycloctenus L. Koch 1878, Arachn. Austr. 1: 2, 987; *C. flaviceps* L. Koch 1878, *ibid.*, 988 Pl. 86: 3 from Indonesia (♀ presumably Vienna; ♂ described by GOYEN 1890 sub *C. fugax*; ♂♀ London). Described in Ctenoidae, transferred into Lycosidae, group Cyclocteneae by SIMON (1898 a). This group was first listed as a subfamily by PETRUNKEVITCH (1923), and this placement was generally accepted until FORSTER (1964 b) transferred this genus into Toxopidae. In my opinion, it is by no means related with Toxopids, but rather constitutes a family own its own in Lycosoidea. Cf. also p. 364. Synonym *Pycnoctenus*, n. syn.

Some species of this genus have been well described by FORSTER (1964 b). See also *Argoctenus*.

Cydippe O. Pickard-Cambridge 1870, Proc. Zool. Soc. London 1870, 731: *C. unguiculata* O. P.-Cambr. 1870, *ibid.* Pl. 44: 2 from Natal (♂ presumably in Oxford). Described in Agelenidae, transferred to Enyoidae (= Zodariidae) by THORELL (1873). Cf. also *Cydrela*, which is a valid objective synonym of this genus. Junior homonym of *Cydippe* Eschscholtz 1829 and *Cydippe* Gray 1852.

Cydrela Thorell 1873. Remarks on synonyms of European Spiders 3, 598. as a novum novum for *Cydippe* O. P.-Cambr. 1870, 598, of Agelenidae, but immediately referred to Enyoidae (= Zodariidae). For generotype, see *Cydippe*. In my opinion, *Cydrela* evidently belongs to the vicinity of Zodariidae, but probably it represents a family of its own or, in any case, it must be referred to some other family than Zodariidae.

Material of *Cydrela* spp. from South Africa examined (Geneva, Berlin & Paris).

Cyllopodia Hentz 1847, Boston Journ. Nat. Hist. Soc. 5, 466: *C. cavata* Hentz 1847, *ibid.* Pl. 30: 3 from Northeastern U.S.A. (♀ no types; ♂ described by EMERTON 1888; ♂♀ Cambridge & Stockholm). Uloboridae: Hyptiotinae. Synonymous with *Hyptiotes*.

Cyrioctea Simon 1889, Ann. Soc. Ent. Fr., 6. Ser. 8, 218: *Drassus spinifer* Nic. 1849 in GAY: Hist. Fis. Polit. Chili 10: 3, 454 from Chile (♀ no types; Paris). Described in Agelenidae, and generally listed in subfamily Cybaeinae since SIMON (1898 a). Transferred independently into Zodariidae also by ROTH (1965).

Dandridgia White 1849, Proc. Zool. Soc. London, 5: *D. dysderoides* White 1849, *ibid.* from New Zealand (♀ no types; ♂ described by O. PICKARD-CAMBRIDGE 1879 sub *Robsonia marina*). By synonymization of this genus with *Desis* (SIMON 1903 a), the name of the generotype became a junior secondary homonym of *Desis dysderoides* Walck. 1837. The current name is derived from *Argyroneta marina* Hector 1878, Trans. N. Zeal. Inst. 10, 299 from New Zealand (♀ no types; ♂♀ Oxford). See *Desis*.

Daramulunia n. gen., p. 392: *Uloborus gibbosus* L. Koch 1871, Arachn. Austral. 1: 1, 228 Pl. 19: 8 from Samoa, Polynesia (♀ Hamburg – London; ♂ described by BERLAND 1938). Uloboridae: Uloborinae.

U. tenellus L. Koch 1871 (♀ Hamburg) = *U. bistriatus* L. Koch 1871 (♂♀ Hamburg – ♀ examined), n. syn. = *D. tenella* n. comb.

Deinopsis (see *Dinopsis*).

Demolodes Mello-Leitão 1943, Rev. Chil. Hist. Nat. 45, 164: *D. iheringi* M.-Leit. 1943, *ibid.* from Brazil (♀ type preservation unknown). Originally described in Pisauridae: Thaumasiinae, and thus it may be a representative of Dolomedidae.

Dereuxma Simon 1906, Ann. Soc. Ent. Belg. 50, 303: *D. arguta* Sim. 1906, *ibid.* from Queensland (♀ Paris). Described in Dictynidae, and

generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Listed here in subfamily Matachiinae, synonymous with the subgenus *Aphycoschaema* of *Badumna*, n. syn.

Desidiopsis Fage 1909, Arch. Zool. Exp. Gén., 4. Ser. 9, Not. & Rev., 75: *D. racovitzi* Fage 1909, ibid. f. 1 – 8 from Riviera, Mediterranean (♂♀ Paris) = *Halocryphoea veneta* Capor. 1934, Ann. Mus. Civ. Trieste 12, 124 f. 2 – 5 from Adriatic coast (♀ presumably in Trieste), n. syn. Described in Agelenidae, generally listed in subfamily Cybaeinae since PETRUNKEVITCH (1928). Transferred here to Dictynidae: Tricholathysinae. Synonymous with *Mizaga*.

Desis Walckenaer 1837, Hist. Nat. Ins. Apt. 1, 610: *D. dysderoides* Walck. 1837, ibid. Pl. 4: 15 from Micronesia (♀ no types) = *Aranea maxillosa* Fabr. 1793, Ent. Syst. 2, 411 from New Guinea (♀ no types). For homonymy of the generotype, see *Dandridgia*. Described in Drasidae, selected by Pocock (1895) as the type genus for the family Desidae. However, it has generally been listed in Agelenidae: Cybaeinae since SIMON (1898 a) and in Argyronetidae by the Japanese authors since KISHIDA (1930). Listed here in Amaurobiidae: Desinae (cf. p. 325). Synonyms *Dandridgia*, *Paradesis*, and *Robsonia*.

There seem to be only a few widespread species in this genus, but the specific revision is still quite incomplete, although the type material of most of the species described has been preliminarily examined.

Devade Simon 1884, Bull. Soc. Zool. France 9, 323 as a nomen novum for *Diotima* Simon 1880: *Diotima hirsutissima* Sim. 1880, Ann. Soc. Ent. France, 5. Ser. 10, Bull., LV from Egypt (♂♀ Paris) = *Amaurobius indistinctus* O. P.-Cambr. 1872, Proc. Zool. Soc. London, 264 from Israel (♀ Oxford), n. syn. = *Altella libyca* Denis 1947, Bull. Soc. Fouad I. Ent. 31, 29 Pl. 1: 1 from Libya (♀ London), n. syn. = *Strinatina spinosa* Denis 1956, Bull. Mus. Nat. Hist. Nat., 2. Ser. 27: 5, 448 f. 2 from archipelago of the Red Sea (♀ Paris), n. syn. = *Devade indistincta* n. comb. Described in Dictynidae, listed here in subfamily Tricholathysinae. Synonyms *Diotima* Simon 1880. *Pseudauximus* Denis 1955, n. syn., and *Strinatina* n. syn.

Devade pusilla Sim. 1910 (♂ Paris), *Pseudauximus libanicus* Denis 1955 (♀ type preservation unknown) = *D. libanica* n. comb.

There is also an undescribed species from Angola (♀ Dundo). The status of *Devade dubia* Capor. 1934 (♀ type

preservation unknown) is obscure; most probably it does not belong here.

Devendra n. gen., p. 318: *Campostichomma pardale* Sim. 1898, Ann. Soc. Ent. Belg. 42, 8 from Ceylon (♀ Paris – ♂ described by SIMON 1898 a: Paris). Although the generotype has always been listed in Agelenidae: Cybaeinae, the new genus is assigned to Miturgidae: Machadoinae.

C. pumilum Sim. 1898 (♂ Paris) = *D. pumila* n. comb., *C. seriatum* Sim. 1898 (♂♀ Paris) = *D. seriata* n. comb.

Diactenus Mello-Leitão 1938, Rev. Mus. La Plata, Zool. 1: 4, 103: *D. bruchi* M.-Leit. 1938, ibid., f. 19 – 20 from the Argentine (♀ La Plata – not available; ♀ London – det. MELLO-LEITÃO). Described in Ctenidae: Cteninae, transferred here to Zoridae. Synonymous with *Odo*, n. syn.

Diallomus Simon 1897, Hist. Nat. Araign. 2: 1, 118: *D. fuliginosus* Sim. 1897, ibid., 119 f. 112 – 113 from Ceylon (♀ Paris), selected by PETRUNKEVITCH (1928). Originally assigned to Clubionidae: Cteninae, Acantheae, and later generally listed in Ctenidae: Acantheinae. Here it is listed in Zoridae. Synonym *Elassoctenus*, n. syn.

D. speciosus Simon 1897 (syntypes ♀♀ ♂ Paris: ♀♀ represent two different species of *Diallomus*, while ♂ seemingly belongs to another Zorid genus). *Elassoctenus harpax* Sim. 1909 (♀ Berlin) = *D. harpax* n. comb.

Diaplograptia Simon 1909, Fauna SW-Austral. 2: 12, 175: *D. striola* Sim. 1909, ibid. from West Australia (♀ type preservation unknown). Described in Clubionidae: Liocraninae, Miturgae, and thus listed here in Miturgidae: Miturginae, although listed in Ctenidae: Argocteninae by MELLO-LEITÃO (1940 a).

Dictyna Sundevall 1833, Consp. Arachn., 16: *Aranea benigna* Walck. 1802, Faun. Paris. 2, 209 from France (no types) = *A. arundinacea* L. 1758, Syst. Nat., 10 ed., 620 from Sweden (no types; ♂♀ described by this name by WESTRING 1861: material from numerous museums and personal collections examined) = *D. davidi* Sch. 1963, Mém. Mus. Nat. Hist. Nat., N. S., Zool. 25: 1, 25 f. 8 from West Chekiang, China (♀ Paris), n. syn. = *D. potanini* Sch. 1963, ibid., 26 f. 9 from Ordos, China (♀ Paris), n. syn. There has been some confusion concerning the generotype of *Dictyna*. SUNDEVALL (*op. cit.*) originally listed only *Theridion benignum* Walck.

and *T. pectitum* Sundev. 1831 without designation of the generotype. The latter species is stated to be a nomen dubium through this revision, and a possible synonym of *Emblyna annulipes* (Bl.) 1846. In fact, *D. arundinacea* has generally been considered the generotype of *Dictyna* since SIMON (1892 a) at least. This opinion agrees with the result of the type designation by elimination. Thus the listing of *Aranea viridissima* Walck. 1802 as the generotype (ROEWER 1954 a, p. 1309) is incorrect for several different reasons. The genus *Dictyna* was originally described in Theridiidae, selected as the type genus for the family Dictynidae by O. PICKARD-CAMBRIDGE (1871), and first listed in its subfamily Dictyninae by PETRUNKEVITCH (1928).

The definition and limitation of this genus has been repeatedly discussed in the past years (CHAMBERLIN 1947, CHAMBERLIN & GERTSCH 1958, etc.), and a thorough analysis of the Palearctic and Ethiopian species by me has brought up numerous facts to facilitate the final solution of this complicated problem. Accordingly, a new limitation of the genus *Dictyna* is presented here (cf. Table 34). Synonyms: *Ergatis* Blackwall 1841 (non Simon 1914), *Operaria*, and *Tosyna*.

The last of them is available as a subgeneric name, but no attempt is made here at a final subdivision of the genus *Dictyna*, although preliminary grouping of the species listed has been made below.

I. *arundinacea* group. The seven Nearctic species have been revised by CHAMBERLIN & GERTSCH (1958, p. 75 – 82) as *brevitarsus* group. The following species are also assigned here: *D. pusilla* Thor. 1856 (♂ no types; ♀ described by SIMON 1874; ♂♀ Helsinki, Stockholm, Basle, Paris, Copenhagen, Warsaw, Berlin & coll. PL) = *D. arundinacea*, Menge 1869 (in part ♀ fig. 143 f), n. syn. and *D. procerula* Bös. & Str. 1906 (♀ Frankfurt; det. PL: Osaka)

II. *longispina* group. For the seven Nearctic species, see CHAMBERLIN & GERTSCH (1958, p. 61 – 70). Material of *D. formidolosa* Gertsch & Ivie 1936 (♂♀ New York – det. Gertsch), *D. bellans* Chamb. 1919 (♂♀ Paris), *D. calcarata* Banks 1904 (♂♀ Paris), *D. agressa* Ivie 1947 (♂♀ Paris), and *D. longispina* Emert. 1888 (♂♀ Paris) examined.

The following Neotropical species at least are also assigned to this group: *D. mandibularis* Tacz. 1874 (♀ Warsaw; det PL ♂♀ Vienna), *D. albicoma* Sim. 1892 (♂♀ Paris), *D. lecta* Chick. 1951 (♂ Cambridge) and *D. columbiana* Becker 1886 (♀ Brussels).

III. *joliacea* group. For the three Nearctic species and the Neotropical *D. albopilosa*, see CHAMBERLIN & GERTSCH (op. cit., p. 73 – 75). Material of *D. joliacea* (Hentz) 1850 (♂♀ Paris) and *D. minuta* Emert. 1888 (♂♀ Paris) examined.

IV. *apachea* group. See CHAMBERLIN & GERTSCH

(op. cit.: 71 – 72), Material of *D. apachea* Chamb. & Iv. 1936 (♂♀ Paris) examined.

The groups II – IV approximately correspond to the genus *Tosyna* of CHAMBERLIN (1948).

V. *volucris* group. For the eight Nearctic species, see CHAMBERLIN & GERTSCH (op. cit., p. 87 – 95). Material of *D. volucris* Keys. 1881 (♂♀ Paris), *D. coloradensis* Chamb. 1919 (♂♀ Paris), and *D. idahoana* Chamb. & Iv. 1933 (♂ Paris) examined.

VI. *hamifera* group. *D. hamifera* Thor. 1872 (♂ Stockholm; ♂♀ Helsinki, Copenhagen, New York, coll. PL) = *D. groenlandica* Lenz 1897 (♀ Berlin – in part, cf. CHAMBERLIN & GERTSCH op. cit., p. 136 – 137) n. syn. = *D. major*: Simon 1914 et seq., non Menge 1869 (cf. *Brigittea*). *D. schmidtii* Kulcz. 1926 (♂ Warsaw – from Kamchatka; det. PL Helsinki – from Lapland; ♀ allotype coll. PL from Lapland, *D. sibirica* Kulcz. 1908 (♀ Leningrad – examined by H. Hippa).

Material of *D. sancta* Gertsch 1946 (♂♀ New York), *D. cebolla* Ivie 1947 (♂♀ New York), and *D. juno* Ivie 1947 (♂♀ New York) also examined. According to CHAMBERLIN & GERTSCH (1958, p. 84) *D. tridentata* Bish. & Ruderm. 1946 also belongs to this group which they call the *major* group.

VII. *uncinata* group. *D. uncinata* Thor. 1856 (no types; ♂♀ Stockholm, Helsinki, Basle, Berlin, Warsaw & coll. PL). *D. armata* Thor. 1875 (♂ Helsinki), non *D. armata* Banks 1911. Besides there is an undescribed species from Northeastern Siberia (♀ Helsinki).

VIII. *joliicola* group. *D. joliicola* Bös. & Str. 1906 (♂♀ Frankfurt; det PL: Osaka). *D. szaboi* Chyzer 1891 (♂♀ Budapest – ? type ♂ examined). *D. felis* Bös. & Str. 1906 (♂♀ Frankfurt; det. PL: Osaka & Berlin) = *D. hummeli* Sch. 1936 (♂♀ Stockholm), n. syn. = *D. paitaensis* Sch. 1953 (♀ Tientsin – not seen), n. syn. = *D. maculosa*: Yaginuma 1962 (♂♀ coll. YAGINUMA), n. syn., non Karsch 1879.

See also *Ajmonia*, *Anaxibia*, *Arangina*, *Archaeodictyna*, *Argenna*, *Banaidja*, *Brigittea*, *Calceophthalmus*, *Cybaeolus*, *Dictynomorpha*, *Emblyna*, *Heterodictyna*, *Lathys*, *Mallos*, *Marilynia*, *Mexillia*, *Nigma*, *Phantyna*, *Sudesna*, *Shango*, *Thallumetus*, *Titanoeca*, *Tivyna*, and *Varyna*.

D. chandrai Tikad. 1965 (♀ Calcutta) is here transferred to Linyphiidae. Besides, some other Theridid and Linyphiid species have been described under the generic name *Dictyna*.

Dictynina Banks 1904, Proc. Calif. Acad. Sci., 3. Ser. 3: 13, 342: *D. pallida* Banks 1904, ibid. from California (♀ Cambridge). Dictynidae: Dictyninae. Synonymous with *Mallos*; cf. also *Heterodictyna* Dahl 1907 (non 1924).

Dictynoides Chamberlin 1919, Ann. Ent. Soc. Amer. 12, 243: *D. arizonensis* Chamb. 1919, ibid., 244 f. 1 from Arizona (♂♀ Cambridge) = *Dictyna dugesi* Becker 1886, Ann. Soc. Ent. Belg. 30, C. R., XXIII from Mexico (♀ Brussels). Dictynidae: Dictyninae. Synonymous with *Mallos*.

Dictynomorpha Spassky 1939, Festschr. Strand 5, 138: *D. strandi* Spassky 1939, *ibid.* f. 1–3 from Turkestan (♂♀ type preservation unknown). Dictynidae: Dictyninae.

Dictyna marakata Sherriffs 1927 (♂♀ London) = *Dictyna turbida* Sim. 1905 (♂♀ syntypes in Paris: in part – cf. also *Brigittea*), n. syn. = *Dictyna tungabhadrai* Tikad. 1965 (♀ Calcutta), n. syn. = *Dictynomorpha marakata* n. comb.; *Dictyna smaragdula* Sim. 1905 (♂♀ Paris) = *Dictynomorpha smaragdula* n. comb., and *Dictyna bedeshai* Tikad. 1965 (♀ Calcutta) = *Dictynomorpha bedeshai* n. comb.

Dictyolathys Banks 1900, Proc. Acad. Nat. Sci. Philadelphia 52, 534: *D. maculata* Banks 1900, *ibid.* from Alabama (♀ Cambridge; ♂♀ New York). By synonymization of this genus with *Lathys* (GERTSCH 1946 a), the name of the generotype became a junior secondary homonym of *L. maculata* Keys. 1890, and a nomen novum, *L. maculina*, was simultaneously proposed for this species. Described in Dictynidae, listed here in subfamily Cicuriniinae.

See also *Zanomys*.

Dinopis MacLeay 1839, Ann. Mag. Nat. Hist., 1. Ser. 2, 9: *D. lamia* MacLeay 1839, *ibid.* Pl. 2: 3 from Cuba (♀ no types; ♂ described by BRYANT 1940; ♂♀ Cambridge). For orthography of the generic name, see BONNET (1956, p. 1379). Selected as the type genus for Dinopidae by C. L. KOCH (1851), but sometimes listed in Uloboridae: Dinopinae, e.g., by SIMON (1892 a), and quite exceptionally in Eresidae by L. KOCH (1867).

Most probably *Dinopis* s. lat. as still limited in this paper, includes several genera comparable to the series *Avellopsis* – *Avella* – *Menneus*. Besides, there is a gradual series of species between the classical *Dinopis* of the old world (*anchietae* and *bicornis* groups) through hornless forms (*lamia* and *fasciata* groups) up to typical *Avellopsis* and *Avella*. However, it was not yet possible to estimate the value of different characters, and the proposed groupings are more or less provisional only, and do not include many species at all.

I. *anchietae* group: *D. anchietae* Brito Capello 1867 (♀ – type preservation unknown; ♂ described sub *D. bubo*; ♀ Geneva), *D. cornigera* Gerst. 1873 (♂ type preservation unknown; ♀ described by SIMON 1890 b sub *D. bubalus*; Paris; Geneva; det. PL: Tervuren, *D. schomburgkii* Karsch 1878 (♀ Berlin), *D. camela* Thor. 1881 (♀ Genoa), *Menneus reticulatus* Rainb. 1899 (♀ Sydney) = *D. reticulatus* n. comb., *D. ornata* Poc. 1902 (♀ London), and *D. celebensis* Merian 1911 (♂♀ Geneva).

II. *bicornis* group: *D. bicornis* L. Koch 1879 (♂ Vienna), *D. aurita* F. O. P.-Cambr. 1902 (♂♀ type preservation unknown), *D. diabolica* Kraus 1956 (♂ Frankfurt – not seen). There is at least one additional species of this group in Central Africa (♂♀ Tervuren).

III: *lamia* group (= *Dinopis* s. str.): Probably restricted to the Neotropical region. KRAUS (1956) presented a key for the Central American species, and all the Neotropical species of *Dinopis* have been catalogued also by SCHIAPELLI & GERSCHMAN DE PIKELIN (1957). *D. bucculentus* Sch. 1953 (♂♀ Basle) is a rather deviating species, and *D. armaticeps* M.-Leit. 1925 and *D. guasca* M.-Leit. may represent an additional group.

IV. *fasciata* group: *D. fasciata*, *D. ravidia*, *D. subrufa*, and *D. tabida* were all described by L. KOCH (1878, 1879 a).

The above list includes no new synonymies, as the specific revision of this large genus has not yet been completed. See also *Avella*.

Diotima Simon 1880, Ann. Ent. Soc. France, 5. Ser. 10, Bull. LV: *D. hirsutissima* Sim. 1880, *ibid.* from Egypt (♂♀ Paris). For its synonymies, see *Devade* (obj. syn.). Jun. homon. of *Diotima* Reichenbach 1854 and *Diotima* Pascoe 1859.

Dirksia Chamberlin & Ivie 1942, Bull. Univ. Utah 32: 13, Biol. 7: 1, 24 as a subgenus of *Ethobuella*: *E. anyphaenoides* Chamb. & Iv. 1942, *ibid.*, 25 Pl. 3: 35–37 from Oregon (♂♀ New York) = *Apostenus cinctipes* Banks 1896, Trans. Amer. Ent. Soc. 23, 65 from Washington State (♀ type preservation unknown). Originally assigned to Agelenidae: Ageleninae, but transferred here to Hahniidae: Cryphoeicinae, closely related to *Calymmaria*. Regarded here as a genus, n. stat.

Cryphoea pyrenaica Sim. (1898 (♂♀ Paris) = *D. pyrenaica* n. comb. is a European representative of this genus.

Dixomys Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 8: *Lathys pinea* Chamb. & Iv. 1944, *ibid.* 35: 9, Biol. 8: 5, 125 f. 182 from Georgia, U.S.A. (♀ New York). Dictynidae: Dictyninae. Synonymous with *Thallumetus*.

Dolomedes Latreille 1804, N. Dict. Hist. Nat. 24, 135. Originally the genus was created without any species named, but with a reference to «les coureuses de Walckenaer». WALCKENAER (1805) first used a binominal combination in connection with the name *Dolomedes*, and thus it was not yet possible to estimate the generotype is *Araneus fimbriatus* Clerck 1757, Aran. Svec., 106 PL. 5: 9 from Sweden (♂ no types; ♀ described by SUNDEVALL 1831; ♂♀ coll. PL). SUNDEVALL (*op. cit.*) first included *Dolomedes* in Lycosoidae, but it was transferred into Pisauridae by SIMON (1898 a). However, BANKS (1892 a) selected this genus as the type of Lycosidae: Dolomedinae. Since PETRUNKEVITCH (1928) it has generally been listed in Pisauridae:

Thaumasiinae. Here it is regarded as the type of the family Dolomedidae in Lycosoidea.

The specific revision of this very large genus has not yet been begun, but obviously the relimitation of *Teippus*, *Thaumasia*, *Hygropoda*, etc. also concerns *Dolomedes*.

Dolopoeus Thorell 1891, K. Sv. Vet. Akad. Handl. 24: 2, 5: *D. cinctus* Thor. 1891, 61 from Nicobar Islands (♀ type preservation unknown). Described in Lycosidae, for later familial affiliation see *Thalassius*, with which *Dolopoeus* was synonymized by SIMON (1898 a).

Dorceus C. L. Koch 1846, Die Arachniden 13, 15: *D. fastuosus* C. L. Koch 1846, ibid. f. 1088 from Senegal (♂ type preservation unknown; ♂♀ Paris) = *D. viberti* Sim. 1910 from Tunis (♂♀ Paris), n. syn. Listed in Eresidae since the creation of this family by C. L. Koch (1851). Rather closely related to *Seothyra*.

The remaining species (Paris) listed by ROEWER (1954 a, p. 1291) all certainly belong to this genus, but *D. latifrons* Sim. 1873 may represent the unknown female of some other species. *Eresus albopictus* Sim. 1873 (♂♀ Paris) = *D. albopictus* n. comb. There is also a rather deviating undescribed species from Central Africa (♂ Geneva).

Dossenus Simon 1898, Ann. Soc. Ent. Belg. 42, 19: *D. marginatus* Simon 1898, ibid. from Brazil (♂♀ Paris). Originally assigned to Pisauridae, Dolomedidae, and listed by PETRUNKEVITCH (1928) in Thaumasiinae and by BONNET (1959) in Dolomedinae. Listed here in Dolomedidae. Synonym *Marxiellia*.

No specific revision has been carried out.

Drances Simon 1898, Ann. Soc. Ent. Belg. 42, 18: *D. striatipes* Simon 1898, ibid. from Venezuela (♀ Paris). Described in Pisauridae, and generally listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae. Objective synonym of *Dyrines*, junior homonym of *Drances* Champion 1889.

Drapeta Menge 1875, Schr. naturf. Ges. Danzig, N.F. 3, 387: *D. aeneus* Menge 1875, ibid. Pl. 70: 234 from Germany (♂♀ originally Gdansk – destroyed) = *Sagana rutilans* Thor. 1875, Tijdschr. Ent. 18, 96 from Central Europe (♂♀ type preservation unknown; ♀ Stockholm). Described in Drassidae, and transferred later to Clubionidae: Liocraninae by SIMON (1897). Synonymous with *Liocranum* (cf. this genus).

Dresserus Simon 1876, Ann. Soc. Ent. France, 5. Ser. 6, Bull., LXXXVII: *D. fuscus*

Sim. 1876, ibid. from East Africa (♀ Paris; Vienna) = *D. inconspicuus* Str. 1906, Zool. Anz. 30: 19 – 20, 668 (♂ type preservation unknown; ♀ described by STRAND 1908), n. syn. Eresidae: Eresinae.

A specific revision proper has not yet been completed due to difficulties caused by the exceptionally simple and invariable structure of the genital organs in different species of this genus. On the other hand, the generic affiliation of all the remaining 23 species has been checked (see the list of species in ROEWER 1954 a, p. 1292 – 1293), except *D. nasiuulva* Str. 1907 through examination of the type material (Cape Town, London, Berlin, Paris, Stockholm, Pietermaritzburg). A lot of unidentified material has also been preliminarily investigated (Tervuren & Geneva) to clarify the range of infraspecific variation.

Drymonia Simon 1875, Arachn. France 2, 81, as a subgenus of *Tegenaria*. No generotype was selected, but this taxon was defined according to the relative length of the posterior spinnerets. SIMON (op. cit.) listed 14 species, most of them, in fact, related with the species listed first: *T. atrica* C. L. Koch 1843. Junior homonym of *Drymonia* Hübner [1819], synonymous with *Tegenaria*.

Dyomonomma Karsch 1879, Stettin. Ent. Zeitschr. 40, 108: *D. drassoides* Karsch 1879, ibid. from Colombia (♀ type preservation unknown). Originally described in Drassidae, but transferred by PETRUNKEVITCH (1911) to Ctenidae: Cteninae, and synonymized with *Ctenus*. In spite of this, some later authors have listed this genus in Gnaphosidae: Drassodinae, e.g., BONNET (1959). Its position has remained obscure to me, but probably it is a representative of Lycosoidea.

Dyrines Simon 1903, Hist. Nat. Araign. 2: 4, 1045 as a nomen novum for *Drances* Simon 1898 (see this genus).

No specific revision has been carried out.

Dyrinoides Badcock 1932, Journ. Linn. Soc. London, Zool., 38, 33: *D. onychiatus* Badcock 1932, ibid. f. 25 from Brazil (juv. ♀ London). Originally assigned to Pisauridae, but simultaneously excluded from Thaumasiinae, in which *Dyrinoides* has since been listed, e.g. by ROEWER (1954 a). Listed here in Lycosoidea incertae sedis.

Ectatosticta Simon 1892, Hist. Nat. Araign. 1: 1, 204: *Hypochilus davidi* Sim. 1888, Ann. Soc. Ent. France, 6. Ser. 8, Bull., CCVIII from

Hopeh, China (♀ Paris; ♂ described by SIMON 1892 a: Paris). Described in Hypochilidae, selected here as the type genus of the family Ectatostictidae (cf. p. 296).

See also *Hickmania*.

Elassoctenus Simon 1909, Fauna SW-Austr. 1: 12, 165: *E. harpax* Simon 1909, *ibid.* from West Australia (♀ Berlin). Described in Ctenidae, and listed in subfamily Calocteninae since PETRUNKEVITCH (1928). Listed here in Zoridae. Synonymous with *Diallomus*, n. syn.

†*Elwina* Thorell 1870, N. Acta reg. Soc. Sci. Upsal., 3, Ser. 7, 224: *Argyroneta antiqua* Heyden 1859, Paläont. 8: 1, 1 f. 11 from coal deposits derived from the Palaeozoic (type preservation unknown). The generotype as well as the genus were described in Agelenidae, but it is evident that this family is younger, and most probably this genus is not a direct relative of the groups treated.

Emblyna Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 8: *Dictyna completa* Chamb. & Gertsch 1929, Journ. Ent. Soc. Claremont 21: 3, 101 Pl. 1: 1 from Utah (♀ New York; ♂ described by GERTSCH 1935: New York). Dictynidae: Dictyninae.

The limitation of *Emblyna* and *Dictyna* has caused some trouble (cf. CHAMBERLIN & GERTSCH 1958, p. 50). The *personata* group is here tentatively included in *Emblyna*. The numerous Nearctic species of this genus have been revised by CHAMBERLIN & GERTSCH (*op. cit.*, p. 95 – 182 Pl. 26 – 47), while the revision of the Neotropical species is in progress. The following notes only are presented here. *D. groenlandica* Lenz 1897 (♀ subad. Berlin) is only in part synonymous with *D. borealis* O. P.-Cambr. 1877 (♀ Oxford – not seen; ♂ Copenhagen & New York), cf. *Dictyna*.

In the Palearctic region there are only two species, which may be only geographic races of the same species, the Holarctic *E. annulipes* (Bl.) 1846 (♂♀ types lost; New York, Helsinki, Stockholm & coll. PL) = ? *D. ignobilis* Kulcz. 1895 (♀ type presumably lost) n. syn. = *D. brevidens*: Schenkel 1930 (♂ Stockholm – from Kamchatka), n. syn. The true *D. brevidens* Kulcz. 1897 (♂ Budapest; Berlin & det. PL: Warsaw; ♀ described by SIMON 1914: Paris) is Central European.

Amaurobius crucifer O. P.-Cambr. 1873 (♀ Oxford – from St. Helena) was transferred by SIMON (1892 a) to *Auzimus*, but here it is assigned to Dictynidae: Dictyninae. Because of the absence of males, the generic affiliation remains unclear, but it may belong to *Emblyna* or *Archaeodictyna*, or represent a genus of its own.

Emmenomma Simon 1884, Bull. Soc. Zool. France 9, 136: *E. oculatum* Sim. 1884, *ibid.* Pl. 3: 8 – 11 from Tierra del Fuego (♂♀ Paris; ♀ Stockholm). Described in Agelenidae, generally listed in subfamily Cybaeinae since SIMON (1898 a). Transferred here to Amaurobiidae: Macrobininae.

E. falklandicum Hogg 1913 (♀ London) may be congeneric with the generotype. In any case, it is not synonymous with the generotype (cf. ROTH 1967 a).

Enoploctenus Simon 1896, Ann. Soc. Ent. France 65, 495: *E. germaini* Sim. 1896, *ibid.* from Brazil (juv. ♀ Paris) = *Ctenus cyclothorax* Bertkau 1880, Mém. Class. Sci. 43, 56 Pl. 1: 18 (♂ type preservation unknown; ♀ described by STRAND 1910 b sub *E. generalensis*: Berlin). Described in Ctenidae and generally listed in Acantheinae since PETRUNKEVITCH (1928). Listed here in Ctenidae: Acanthocteninae.

E. maculipes Str. 1910 (♂♀ – ♀ Berlin) and *E. pedatissimus* Str. 1910 (♂ Berlin) seem to be congeneric with *E. cyclothorax*, while the status of the remaining species remains obscure. BUCHERL (1951) presented a revision of this genus.

Enyo Savigny & Audouin 1825, Explic. Planch. Arachn. Savigny Descr. Egypt: 4, 135 (cf. *Zodariion*). Originally no generotype was selected, but AUDOUIN (1827) included in this genus two species, *E. nitida* Aud. 1827, *ibid.* 2. ed., 350 Pl. 3: 7 (♀) and *E. longipes* Aud. 1827, *ibid.*, 351 Pl. 3: 8 (♂), which have been regarded as different sexes of the former species. In spite of this fact, BONNET (1956, p. 1676) lists *E. longipes* as the generotype of this genus. Included in Therididae by C. L. KOCH (1850), but selected as the type genus for the family Enyoidae by THORELL (1870 a), and later generally listed in this family under its current name *Zodariidae*, except by O. PICKARD-CAMBRIDGE (1872), who placed this genus in Agelenidae. Synonymous with *Zodariion*. Junior homonym of *Enyo* Hübner [1819].

See BONNET (1956, p. 1676 – 1677).

†*Eocryphoea* Petrunkevitch 1946, Amer. Mus. Novit. 1328, 4: *Tegenaria gracilipes* Koch & Ber. 1854, in BERENDT: Die im Bernstein befindlichen organische Reste der Vorwelt 1: 2, 47 Pl. 16: 139 from Baltic amber (types presumably lost; ♂ described by PETRUNKEVITCH 1958: Berlin – not seen). Described in Agelenidae: Ageleninae, listed here as Amaurobiodea incertae sedis.

PETRUNKEVITCH (1958, p. 126) listed two additional fossil species of this genus.

†*Eohahnia* Petrunkevitch 1958, Trans. Conn. Acad. Arts Sci. 41, 359: *E. succini* Petr. 1958, *ibid.* f. 590 – 591 from Baltic amber (♀ Copenhagen II – not seen). Hahniidae, exact position obscure.

†*Eolathys* Petrunkevitch 1950, Bull. Mus. Comp. Zool. Harvard 103: 5, 268: *E. succini* Petr. 1950, *ibid.*, 269 f. 11 – 18 & 183 – 184 from Baltic amber (? juv. ♀ Cambridge – not seen). Described in Dictynidae, listed here in subfamily Dictyninae; thus this genus is not closely related to *Lathys*.

E. debilis Petr. 1950 (♀ Cambridge – not seen) probably is not congeneric with the genotype.

†**Eomatachia** Petrunkevitch 1942, Trans. Conn. Acad. Arts Sci. 34, 222: *E. latifrons* Petr. 1942, ibid. Pl. 8: 64 – 68, 46: 429 – 437, 47: 438 & 57: 531 – 533 from Baltic amber (♂ London – not seen). Described in Psechridae: Matachiinae, but B. MARPLES (1962) doubted the proposed close affinity between *Matachia* and *Eomatachia*. The latter genus is here transferred to Amaurobiidae: Amaurobiinae (cf. also p. 340).

Epimecinus Simon 1908, Fauna SW-Austr. 1: 12, 376: *Aphycloschaema nexibilis* Sim. 1906, Ann. Soc. Ent. Belg. 50, 299 from New Caledonia (♀ Paris). PETRUNKEVITCH (1928, p. 92) erroneously listed *E. tegenarioides* Sim. 1908 as the genotype. Described in Dictynidae s. lat., generally listed in Amaurobiidae since PETRUNKEVITCH (*loc. cit.*). Transferred here to Amaurobiidae: Matachiinae.

Aphycloschaema pullata Sim. 1906 (♀ Paris), *E. humilis* Berl. 1924 (♀ Paris), *Syroris aucklandensis* R. Marples 1959 (♀ Dunedin – not seen) = *E. aucklandensis* n. comb. See also *Baiami*.

†*Eresoides* Gourret 1888, Rec. Zool. Suisse, 1. Ser. 4: 3, 454: *E. orbicularis* Gourr. 1888, ibid. Pl. 21: 16 from a calcareous swamp in France from Oligocene (presumably in Marseilles). Described in Eresidae, but does not belong there. GOURRET (*op. cit.*, p. 455) emphasized some features referring to Scytodidae, but the final position remains obscure.

Eresus Walckenaer 1805, Tabl. Aran., 21: *Aranea cinnaberina* Oliv. 1789, Encycl. Méthod. 4, 221 from Europa (no types; ♂ described by Rossi 1790 sub *Aranea quatuorguttata*, ♀ by PETAGNA 1792 sub *A. nigra*; numerous museums). The synonymy of the genotype is a complicated problem; during the last century both sexes were repeatedly listed in separate genera. Until recent times (e.g., BONNET 1956, p. 1730) the specific name derived from *Aranea nigra* Petagna 1787, Spec. Ins. Calabr., 34 (no types) has generally been used alternatively with *cinnaberina*, although this is a junior homonym of *A. nigra* Fabr. 1775. BONNET (*loc. cit.*) pointed out that *Aranea sandaliata* Martini & Goeze 1778 (n. nov. for a prior invalid name of SCHAEFFER 1767) is the valid name for this species, but he emphasized the unappropriateness of such a change in the current practice after 170 years. Thus the name *cinnaberinus* is used here and a proposal for the official invalidation of *Aranea*

sandaliata and *Aranea nigra* Pet. will be published elsewhere.

Eresus was included by C. L. KOCH (1837) in Attides, but later he (C. L. KOCH 1851) selected it as the type genus of the family Eresidae. The subfamily name Eresinae was first used by SIMON (1903 a). However, this genus was still listed in Salticidae, e.g. by DOLESCHAL (1852) and BLACKWALL (1861), and even in Dictynidae by O. PICKARD-CAMBRIDGE (1872). For the early history of the placing of this genus, see also BERTKAU (1877). Synonym *Erythrophorus*; formerly used only for the males.

Numerous species of Eresids were originally assigned into *Eresus*, and several colour variants of the genotype have been regarded as good species. The specific revision of this genus is still incomplete, but the following species seem to be clearly distinct from each other: *E. walckenaeri* Brullé 1832 (♀ no types; ♂ described by BRULLÉ *op. cit.* sub *E. audouinii*; Vienna, Gothenburg & Lund), *E. rotundiceps* Sim. 1873 (♂ Paris), *E. sedilloti* Sim. 1881 (♂ Paris), *E. semicanus* Sim. 1908 (♂ Paris), and *E. solitarius* Sim. 1873 (♂ Paris) = *E. lautus* Sim. 1873 (♂ Paris), n. syn. *E. pharaonis* Walck. 1837 (♀ no types; Paris) is evidently the female of some of the species listed above. *E. annulipes* Luc. 1856 (♂ type preservation unknown) from Brazil is probably a specimen of the genotype or *E. walckenaeri*, carried by man to the Neotropical region. The Ethiopian species are here transferred to *Gandanameno*, which is more closely related to *Dresserus* than to *Eresus*. See also *Adonea*, *Dorceus*, and *Stegodyphus*.

Ergatis Blackwall 1841, Trans. Linn. Soc. London 608: *Theridion benignum* Walck. 1802 (see *Dictyna*). Originally assigned to Theridiidae, selected as the type genus for Ergatidae by WALCKENAER (1847), and listed in Ciniflonidae by BLACKWALL (1861). Later generally listed in Dictynidae. Senior homonym of *Ergatis* Heinemann 1877, but junior synonym of *Dictyna*. Cf. also below.

See also *Brigittea*, *Emblyna*, and *Nigma*.

Ergatis Simon 1914, Arachn. France 6: 1, 51 as a subgenus of *Dictyna*: *Aranea viridissima* Walck. 1802, Faun. Paris. 2, 212 from France (♂♀ no types; Helsinki, Warsaw, Stockholm & Budapest). See *Nigma*. The use of an objective synonym of the genus as a subgeneric name is not possible according to the rules of nomenclature. Cf. also *Heterodictyna*. Synonymous with *Nigma*. Dictynidae: Dictyninae.

Erythrophorus C. L. Koch 1851, Uebers. Arachnidensyst. 5, 70: *Aranea cinnaberina* Oliv. 1789 (see *Eresus*). Eresidae: Eresinae. Synonym of *Eresus*.

† **Esuritor** Petrunkevitch 1942, Trans. Conn. Acad. Arts Sci. 34, 234: *E. spinipes* Petr. 1942, *ibid.*, p. 235 Pl. 8: 69–72 from the Baltic amber (juv. ♀ London – not seen). Originally assigned to Pisauridae: Thaumasiinae, listed here in Dolomedidae.

Ethobuella Chamberlin & Ivie 1937, Ann. Ent. Soc. Amer. 30: 2, 223: *E. tuonops* Chamb. & Iv. 1937, *ibid.* Pl. 8: 55–60 from Vancouver Island, British Columbia (♂♀ New York). Described in Agelenidae, later listed in the subfamily Ageleninae by CHAMBERLIN & IVIE (1942 b) and ROEWER (1954 a), but as incertae sedis by BONNET (1959). Listed here in Hahniidae: Cryphoecinae.

E. hespera Chamb. & Iv. 1937 (♀ New York) also belongs here. See also *Dirksia*.

Eucamptopus Pocock 1900, Fauna Brit. India, Arachn., 245: *E. coronatus* Poc. 1900, *ibid.* from India (♂ type preservation unknown). Described in Pisauridae, and listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae.

Eumechanus Gistel 1848, Naturg. Thierr., X as a nomen novum for *Platyscelum* (see this genus). See also BONNET (1956, p. 1812) and *Palpimanus*, the current name of this genus.

Eutichurus Simon 1896, Ann. Soc. Ent. France, 6. Ser. 16, 502: *E. ferox* Sim. 1896, *ibid.* from Ecuador (♂♀ Paris). Originally assigned into Clubionidae: Clubioninae, transferred here into Miturgidae and selected as the type genus of the subfamily Eutichurinae.

A specific revision of this large genus has not yet been carried out. Material of *E. furcifer* Kraus 1955 (♂ Frankfurt) also examined.

Euxinella Drenski 1938, Festschr. Strand. 4, 570: *E. strandi* Drenski 1938, *ibid.*, 571 Pl. 9: 1–7 from Bulgaria (♂♀ Sofia – not seen). For synonymes, see *Nurscia*. Described in Theridiidae, transferred to Amaurobiidae by LEVI & LEVI (1962): «Close to *Titanoeca albomaculata* Lucas». Transferred here to Titanocidae. Junior homonym of *Euxinella* Moisseiev 1936. Synonymous with *Nurscia*, n. syn.

Exlinea n. gen., p. 341: *Clubiona rorulenta* Nic. 1849, in GAY: Hist. Fis. Polit. Chili 10: 3, 437 from Chile (♀ no types; ♂♀ described by SIMON 1902 a: Hamburg; det PL: Paris, Warsaw, & Berlin) = *Amaurobius platei* F. O. P.-Cambr. 1899, J. Linn. Soc. London 27, Zool., 18 Pl.

2: 3 from Peru (♂ Berlin), n. syn. (non ♀ in CHAMBERLIN 1916; cf. *Goeldia*) = *A. illudens* M.-Leit. 1940, Rev. Mus. La Plata, N. S. 2, Zool., 17 f. 17 from Argentina (♂ La Plata: Buenos Aires comp. SCHIAPELLI & GERSCHMAN DE PIKELIN). The generotype was originally described in Drasidae, but has generally been listed in Amaurobiidae since SIMON (*op. cit.*). The new genus is assigned to subfamily Metaltellinae.

Amaurobius arcoiris M.-Leit. 1943 (♀ São Paulo 1 – not available; det. PL: Paris & Santiago) = *E. arcoiris* n. comb. *Clubiona sinistra* Nic. 1849 also belongs here, but as there is no type material, its status cannot be settled; here it is considered a nomen dubium. There is also one undescribed species, at least, from Chile (♂♀ Santiago). In a large number of specimens investigated up to date, a distinct pattern of allometric growth of the relative size of the eyes has been observed; thus the specific revision of *Exlinea* is a complicated problem, as there is certainly some variation in the genitalia, too.

Fecenia Simon 1887, Ann. Soc. Ent. France. 6. Ser. 7, Bull. CXCIV as a nomen novum for *Mezentia* Thor.: *M. angustata* Thor. 1881, Ann. Mus. Civ. Genova 17, 204 from Ternatè Island, Indonesia (♀ Genoa–Stockholm; Berlin) = *Tegenaria ochracea* Dolesch. 1859, Acta Soc. Ind. Neerl. 5, 50 Pl. 8: 8 from Ambon, Indonesia (♀ type preservation unknown: topotypes in Paris; det. PL: Warsaw & Berlin), n. syn. = *F. majorensis* Sim. 1906, Ann. Soc. Ent. Belg. 50, 287 f. 1 A from Mafor Island, adjacent to New Guinea (♀ Paris), n. syn. = *F. montana* Kulcz. 1910, Denkschr. Akad. Wiss. Wien 85, 389 Pl. 17: 1 from Bismarck Archipelago, Micronesia (♀ Vienna), n. syn. = *F. oblonga* Rainb. 1913, Rec. Austr. Mus. 10: 1, 7 f. 5 from Solomon Islands, Polynesia (♀ Sydney – not seen), n. syn. = *F. cinerea* Hogg 1914, Proc. Zool. Soc. London, 4, Remarks p. 56 from New Guinea (♀ London), n. syn. = *F. buruana* Reim. 1936, Treubia 7, Suppl., 406 f. 1 from Buru Island, Indonesia (♂♀ Amsterdam), n. syn. Accordingly, the generotype must be called *F. ochracea* (Doleschal). Described in Amaurobiidae, transferred to Psechridae by SIMON (1892 a). Synonym: *Mezentia* Thor. (obj. syn.).

F. cylindrata Thor. 1895 (♂♀ Genoa–Stockholm). *F. macilenta* (Sim.) 1885 (♂ Paris) = *F. travancoria* Poc. 1899 (♀ London) n. syn. = *F. sumatrana* Kulcz. 1908 (♀ Warsaw; Vienna) n. syn.

The status of *F. protensa* Thor. 1891 (juv. – type preservation unknown) is obscure, but probably it is synonymous with some of the three species above.

Filistata Latreille 1810, Consid. Gen. Crust. Ins. 35, 21: *F. testacea* Latr. 1810, *ibid.* from

Southern Europe (no types) = *Aranea insidiatrix* Forskål 1775, Descr. Anim., 86 from the Mediterranean region (no types; ♀ described by WALCKENAE 1837, ♂ by LUCAS 1846, both sub *F. bicolor* Latr. 1817; ♂♀ Paris, ♀ Budapest, Gothenburg, Vienna & Geneva). This genus was originally included in Mygalides (e.g., C. L. KOCH 1837 and THORELL 1858). AUSSERER (1867) selected it as the type genus for the family Filistatidae. Synonymy *Teratodes*.

The limitation of *Filistata* has been radically changed here, and now it consists merely of Palearctic and Ethiopian species. Until now, only *F. afghana* Roew. 1963 (♀ Lund) and *F. puta* O. P.-Cambr. 1876 (♀ type preservation unknown; Paris) = *F. incondita* Kulcz. 1901 (♀ type preservation unknown; Helsinki), n. syn. has been stated to be certainly congeneric with *F. insidiatrix*, while *F. nigra* Sim. 1897 (♀ Paris) is here included in this genus with some reservations. See also Andoharano, *Filistatinella*, *Filistatoides*, *Kukulcania*, *Malalistata*, *Pikelinia*, *Pritha*, and *Zaitunia*.

* ***Filistatinella*** Gertsch & Ivie 1936, Amer. Mus. Novit. 858, 1: *Filistata crassipalpus* Gertsch 1935, ibid. 792, 5 f. 4–6 from Texas (♂♀ New York). Filistatidae.

Filistatoides F. O. Pickard-Cambridge 1899, Biol. Centr. Amer., Aran. 2, 47: *Filistata insignis* O. P.-Cambr. 1896, ibid., Aran. 1, 211 Pl. 26: 12 & 28: 8 from Guatemala (♂♀ London). Filistatidae.

ZAPFE (1961) described another species from Chile, *Filistatoides milloti* (♂♀ Santiago de Chile), and the following Neotropical species at least also belong there, as stated by MELLO-LEITÃO (1946): *Filistata fasciata* Banks 1902 (♀ type preservation unknown), *Filistata mendensis* M.-Leit. 1919 (♂♀ type preservation unknown), and *Filistata metamerica* M.-Leit. 1940 (♀ La Plata – not available).

Forsterina n. gen., p. 327: *Aphyctoschaema cryphoeiformis* Sim. 1908, Fauna SW-Austr. 1: 12, 374 f. 2 c–d from West Australia (♂♀ Paris). Amaurobiidae: Matachiinae.

A. virgosa Sim. 1908 (♂♀ Paris – Berlin) = *F. virgosa* n. comb., *A. velifera* Sim. 1908 (♂ Paris – Berlin) = *A. bivittata* Sim. 1908 (♀ Paris – Berlin), n. syn. = *F. velifera* n. comb., *Syrorisa alticola* Berl. 1924 (♀ Paris; Basle) = *A. alacris* Berl. 1924 (juv. ♂ Paris; Basle), n. syn. = *F. alticola* n. comb., *A. armigera* Sim. 1908 (♂♀ Paris) = *F. armigera* n. comb., *A. vultuosa* Sim. 1908 (♀ Paris – Berlin) = *A. albicauda* Sim. 1908 (♀ Paris – Berlin), n. syn. = *F. vultuosa* n. comb., *Amaurobius segestrinus* L. Koch 1872 (♀ ? type – Vienna) = *F. segestrina* n. comb., *Amaurobius annulipes* L. Koch 1872 (♂ Hamburg) = *F. annulipes* n. comb., *Maniho arboris* R. Marples 1959 (♀ Dunedin – not seen) = *F. arboris* n. comb.

Galliena Simon 1898, Hist. Nat. Araign. 2: 2, 353: *G. montigena* Sim. 1898, ibid., f. 345 from

Java (♀ Paris). Described in Lycosidae: Cyclocteneae, generally listed in subfamily Cyclocteninae since PETRUNKEVITCH (1928). FORSTER (1964 b) supposed that this genus could be related with the Toxopid *Toxopsiella*. I agree with him, except that both genera are listed in Cycloctenidae.

Gandanameno n. gen., p. 389: *Eresus spenceri* Poc. 1900, Ann. Mag. Nat. Hist., 7. Ser. 6, 322 from Capland (♀ London) = *E. namaquensis* Purc. 1908, Denkschr. Med. Nat. Ges. Jena 13, 221 Pl. 11: 9 from Namaqualand, South Africa (♀ Berlin), n. syn. = *E. depressus* Tucker 1920, Ann. S. Afr. Mus. 17: 5, 445 Pl. 29: 2 from South Africa (♂♀ Cape Town), n. syn. Eresidae: Eresinae, related to *Dresserus*.

Group I (*spenceri*): *E. inornatus* Poc. 1898 (♀ London) = *G. inornata* n. comb., *E. purcelli* Tucker 1920 (♀ Cape Town) = *G. purcelli* n. comb.

Group II (*jumosus*): *Eresus fumosus* C. L. Koch 1838 (♀ no types; ♂ described by TUCKER op. cit.; ♀ Vienna; det. PL: Geneva) = *G. fumosa* n. comb., *E. echinatus* Purc. 1908 (♀ Berlin – Cape Town) = *G. echinata* n. comb.

Gasparia B. Marples 1956, Rec. Auckl. Inst. Mus. 4: 6, 334: *G. nebulosa* B. Marples 1956, ibid. f. 3 from Three Kings Islands, adjacent to New Zealand (♀ Auckland – not seen). Originally assigned into Agelenidae, transferred here to Amaurobiidae: Desinae. Synonym *Hina* Forster 1964, n. syn.

Ostearius delli Forst. 1955 (♀ Wellington – not seen; ♂ described by FORSTER 1964 a sub *Hina delli*: Honolulu – not seen) = *G. delli* n. comb.

Gephyroctenus Mello-Leitão 1936, Festschr. Strand 1, 26: *G. philodromoides* M.-Leit. 1936, ibid. Pl. 2: 49 from Paraná, Brazil (♂ type preservation unknown; ♀ undescribed – det. PL: Paris). Originally assigned to Ctenidae: Calocteninae as an Ecribellate genus. Stated here to be a Cribellate genus and transferred to subfamily Acanthocteninae.

I have not been able to check the status of two species described by CAPORACCIO (1947).

Giltayia Kishida 1955 (1928?), Acta Arachnol. 14: 1, 11: *Cryphoea arietina* Thor. 1871, Rem. Syn. Eur. Spid. 2, 165 as a nomen novum for *Hahnna pratensis* Westr. 1862, Aran. Svec., 318 from Sweden (♂♀ no types; coll. PL, Saaristo, Hynnä & Polenec). Originally assigned to Agelenidae: Cicuriniinae, tribus Tetrilini, but it has remained totally unknown to the European authors. Transferred here into Hahniidae:

Cryphoecinae. Synonymous with *Tuberta*. The phonetically very similar generic name *Gilltaya* Mello-Leitão 1932 is not, in fact, a homonym of *Gilltaya* (ICZN 1964 § 57 – 58), and thus the latter is available as a subgeneric name, and it has priority over *Paratetrilus* for this purpose.

The relative size of the eyes of the generotype is variable, to some extent at least. A detailed statistical analysis of the infraspecific variation will be necessary to show whether *Tuberta arietina macrophthalma* Kulcz. 1897 (♂♀ Budapest; London) and *Tetrilus lucifugus* Sim. 1898 (♀ Paris) are synonyms of *Tuberta arietina* or not.

Goeldia Keyserling 1891, Spinn. Amer. 3, Bras. Spinn., 45: *Goeldia obscura* Keys. 1891, ibid. Pl. 1: 20 from Brazil (♂ London) = *Calleva paupercula* Sim. 1892, Hist. Nat. Araign. 1: 1, 239 from Argentina (subad. ♀ Paris), n. syn. = *Amaurobius patellaris* Sim. 1893, Ann. Soc. Ent. France 61, 434 Pl. 9: 8 from Venezuela (♂♀ Paris; det PL: Berlin & Hamburg) = *Aymarella munda* Chamb. 1916, Bull. Mus. Comp. Zool. Harvard 60: 6, 209 Pl. 9: 1 – 5 from Peru (♀ Cambridge), n. syn. = *Amaurobius platei*: Chamb. 1916, ibid., 208 from Peru (♀ Cambridge), n. syn. (non *A. platei* F. O. P.-Cambr. 1899: ♂). For orthography of the generic name, see BONNET (1957, p. 2030). The complicated synonymy and homonymy of the generotype has caused some trouble. The oldest name *G. obscura* Keys. 1891 is a manifold homonym as presented in the scheme below, where the current names are listed farthest to the right. The oldest synonym available as the valid name for the generotype of *Goeldia*, *paupercula*, refers to juvenile material and therefore its synonymy may be doubted. Thus I prefer *Goeldia patellaris* (Sim.) 1893, and I will submit an application for the stabilization of this name.

Described in Clubionidae, transferred to Amaurobiidae by ROEWER (1954 a). Transferred here to Titanocidae. Synonyms *Aymarella*, *Calleva*, and *Temecula*, all new synonyms. Sen. homon. of *Goeldia* Theobald 1903.

There are at least three additional species, one of them undescribed (♀ Hamburg – from Chile): *Titanoeca luteipes* Keys. 1891 (♂♀ London) = *Amaurobius cothurnatus* M.-Leit. 1943 (♂ La Plata – not seen, Buenos Aires: comp. SCHIAPELLI & GERSCHMAN DE PIKELIN in litt. n. syn.) = *G. luteipes* n. comb., *Titanoeca junesta* Keys. 1883 (♀ London) =

T. obscura Keys. 1877 (♀ London), n. syn. (for homonymy, see the affixed schema) = *Temecula mexicana* O. P.-Cambr. 1896 (♂♀ London), n. syn. = *G. junesta* n. comb., *Titanoeca tizamina* Chamb. & Iv. 1938 (juv. ♀ New York), *Aebutina nigra* M.-Leit. 1915 (♀ type preservation unknown) and *Amaurobius arnozi* M.-Leit. 1924 (♀ type preservation unknown) seem to belong to this genus, but their synonymies with the species examined remain obscure.

Gohia Dalmas 1917, Ann. Soc. Ent. France 86, 403: *Rubrius falxatus* Hogg 1909, Subantarct. Isl. New Zealand 1, Spid., 170 Pl. 8: 4 from Auckland Islands adjacent to New Zealand (♂ Dunedin – not seen; Paris). Described in Agelenidae, listed sometimes in subfamily Cybaeinae (PETRUNKEVITCH 1928), sometimes in Argyro-netidae (ROEWER 1954 a). FORSTER (1955 a) observed structural affinities between this genus and *Matachia* (then in Psecridae) but, however, listed *Gohia* in Agelenidae. Transferred here to Amaurobiidae: Desinae.

FORSTER (1964 a) revised the species of this genus that were available to him in New Zealandian museums. It seems probable that *Rubrius rufus* Berl. (♀) also belongs here, but FORSTER (1955 a, 1964 a) did not mention this species at all when he revised the spiders of the Subantarctic Islands of New Zealand. It is noteworthy that at least one species of this genus was originally described in the genus *Chiracanthium*, Clubionidae. See also Huara.

Gytha Keyserling 1891, Spinn. Amer. 3 (Bras. Spinn.), 28: *G. obscura* Keys. 1891, ibid. Pl. 1: 8 from Brazil (♀ London). Described in Drassoidae s. lat., but listed by SIMON (1897 a) in Clubionidae: Liocraninae as incertae sedis. Later always listed there. Transferred here to Gnaphosidae.

Hackmania n. gen., p. 356: *Argenna prominula* Tullg. 1948, Ent. Tidskr. 69, 159 f. 2 A – E from Lapland (♀ Stockholm; ♂ described by HACKMAN 1950: Helsinki; ♂♀ coll. PL & O. Lindqvist). Dictynidae: Tricholathysinae.

The synonymies of the generotype can not yet be exactly listed, although it is probable that there is only one species with considerable structural variation within the single populations, and probably some geographic variation, Cf. the deviating opinion of CHAMBERLIN & GERTSCH (1958, pp. 12 – 14). Paratype material of both Nearctic species. *A. saphes* Chamb. 1948 (♂♀ New York) and *A. lorna* Chamb. & Gertsch 1958 (♀ New York) examined.

Hadites Keyserling 1862, Verh. Zool. Bot. Ges. Wien 12, 542: *H. tegenarioides* Keys. 1862, ibid. Pl. 16: 2 from the Dalmatian archipelago, Yugoslavia (♂♀ London; ♀ Paris). Described in Agelenidae, later generally listed in subfamily

<i>Aranea obscura</i>	<i>Titanoeca obscura</i>	<i>Goeldia obscura</i>	<i>Amaurobius obscurus</i>	Current name
A.o. Olivier 1789 =				= <i>Alopecosa trabalis</i> (Clerck) 1757
A.o. Fabricius 1793 =				= <i>Pisaura mirabilis</i> (Clerck) 1757
A.o. Walckenaer 1802 =	T.o. (Simon 1914) =	G.: n. comb.	= A.: (Simon 1892)	= <i>Titanoeca quadriguttata</i> (Hahn) 1831
	T.o. Keyserling 1877 =	G.o. Keyserling 1891	= A.o. (Petrunkevitch 1911)	= <i>Goeldia junesta</i> (Keyserling) 1883
	T.o. (Simon 1904) =		= A.: (Simon 1892)	= <i>Goeldia patellaris</i> (Simon) 1893

Ageleninae, except by KISHIDA (1955) in Textri-chinae. Listed here in Ageleninae, tribus Tege-narini.

KRATOCHVIL (1938) divided the Yugoslavian species of this genus in two subgenera, *Hadites* (s. str.) and *Roeweriana*, but it is probable that the latter consists of a polytypic species with four allopatric but geographically very close subspecies: *H. myops* Sim. 1885 (♀ Paris), *H. bidens* Absol. & Krat. 1932 (♂♀ type preservation unknown), *H. dubius* (♂♀ type preservation unknown), and *H. bidens krivosijanus* Krat. 1935 (♀ type preservation unknown). Synonym *Ommathadites*, n. syn. (obj. syn. of *Roeweriana*).

Haemilla Simon 1909, Ann. Soc. Ent. Belg. 53, 49: *Tegenaria mirabilis* L. KOCH 1875, Aegypt. Abyss. Arachn. Jickeli 34 Pl. 4: 2 from Ethiopia (♂ London; ♂♀ Paris). Described in Dictynidae, and generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Transferred here to Amaurobiidae: Phyxelidi-nae; synonymous with *Phyxelida*.

See also *Themacrys* and *Xevios*.

Hahnia C. L. KOCH 1841, Die Arachniden 8, 61: *H. pusilla* C. L. Koch 1841, ibid. f. 637 – 638 (non 639) from Central Europe (♂♀ no types; coll. PL & Stockholm). Originally assigned to Drassides, but transferred to Agelenides by C. L. KOCH (1851), and selected as the type genus for Hahniidae by BERTKAU (1878). In accordance with SIMON (1892 a), some authors until recent times regarded Hahniinae as a subfamily of Agelenidae only. Listed here in Hahniidae: Hahniinae, related to *Muizenbergia*. Senior homonym of *Hahnia* Ellenrieder 1862.

The classical genus must be radically relimited, as most of the exotic species of this family have been placed in this genus only according to the relative size of the anterior median eyes. In fact, the genus *Iahnia* is only Holarctic – Neotropical. For the complicated synonymies of different species, see M. DAHL (1937 a) and ROEWER (1954 a, pp. 100 – 105) and HARM (1966).

Group I (*pusilla*): *H. bressica* Sim. 1875 (♂♀ Paris) = *H. helveola* auct., *Agelena nava* Bl. 1841 (♂♀ probably Oxford; coll. PL), *H. arizonica* Chamb. & Iv. 1942 (♂♀ New York).

Group II (*ononidum*): *H. ononidum* Sim. 1875 (♂♀ Paris; coll. PL) = *H. mengei* auct. (cf. ROEWER 1954 a) = *H. jacksoni* Roew. 1951, independently synonymized also by HARM (1966) = *H. inornata* Chamb. & Iv. 1942 (♂♀ New York), n. syn., *H. cinerea* Emert. 1889, (♂ New York; ♀ described by EMERTON 1902; ♀ Urbana). Most specimens of the syntype material of *Bigois antarctica* Sim. 1902 (♂♀ Paris – non Hamburg) belong to an undescribed species of this group.

Group III (*corticicola*): *H. corticicola* Bös. & Str. 1906 (♂♀ Frankfurt – not seen; det. PL: Berlin, Paris & New York).

Group IV (*heterophthalma*): *H. heterophthalma* Sim. 1905 (♀ Paris). Because of absence of males, the generic affiliation of this Patagonian species remains uncertain.

Group V (*ljovuschkini*): *Iberina ljovuschkini* Pichka 1965 (♀ Moscow – not seen) = *H. ljovuschkini* n. comb.

Some Nearctic and Neotropical species cannot yet be placed.

See also *Antistea*, *Cryphoea*, *Iahnistea*, *Iberina*, *Muizenbergia*, *Neoantistea*, *Neoviola*, and *Neohahnia*.

Hahnioops Roewer 1942, Veröff. Deutsch. Kolon. Überseemus. 3: 3, 250: *H. eidmanni* Roew. 1942, ibid. Pl. 19: 6 e from Fernando Pó, Guinean Gulf (♀ orig. Bremen – now probably Frankfurt). Described in Hahniidae, listed here in Hahniinae (s. str.). Synonymous with *Muizenbergia*, n. syn.

Hahnistea Chamberlin & Ivie 1942, Bull. Univ. Utah 32: 13, Biol. 7: 1, 28: *H. longipes* Chamb. & Iv. 1942, ibid. Pl. 5: 58 from California (♀ New York). Described in Agelenidae, listed here in Hahniidae: Hahniinae (s. lat.).

Hahnia sanjuanensis Exl. 1938 (♀ New York) = *Iahnistea sanjuanensis* n. comb.

Halocryphoea Caporiacco 1934, Ann. Mus. Civ. Trieste 12, 124: *H. veneta* Capor. 1934, ibid. f. 2 – 5 from the Adriatic coast, Italy (♀ presumably in Trieste) = *Desidiopsis racovitzae* (see *Desidiopsis*). Described in Agelenidae: Agele-ninae, transferred here to Dictynidae: Tricholathysinae. Synonymous with *Mizaga*, n. syn.

Iamataliwa Keyserling 1887, Verh. Zool.-Bot. Ges. Wien 37, 457: *H. grisea* Keys. 1887, ibid., 458 Pl. 6: 24 from North America (♀ London; ♂ described by BRADY 1964; ♂♀ New York). Described in Agelenidae, selected as the type genus for the family Iamatalividae (*sic!*) by MARX (1890), but transferred to Oxyopidae by SIMON (1898 a), and since then always listed there. According to BRADY (*op. cit.*), *Oxyopeidon* is the only synonyme of *Iamataliwa*, although additional synonymes have been proposed by SIMON (*op. cit.*) and ROEWER (1954 a).

BRADY (*op. cit.*) has revised the Nearctic species of this genus.

† *Hasseltides* Weyenbergh 1869, Arch. Mus. Teyler 2, 253: *H. primigenius* Weyenb. 1869, ibid. from limestone bed from the Mesozoic (Haarlem – not seen). Described in Agelenidae, but later transferred to the order Phalangida.

Hebrithetele Berland 1938, Ann. Soc. Ent. France 107, 137: *H. longicauda* Berl. 1938, ibid., f. 21 – 25 from the New Hebrides (♀ Paris). Originally assigned into Clubionidae: Clubioni-nae, transferred here into Miturgidae, in which it must be listed as incertae sedis.

Hecaerge Blackwall 1832, Lond. Edinb. Phil. Mag., 3. Ser. 3, 193: *H. maculata* Bl. 1832, ibid. from England (♂♀ no types) = *Lycaena spinimana* Sundev. 1832 (see *Zora*). For familial affiliation see *Zora*, the current name of this genus. Junior homonym of *Hecaerge* Ochsenheimer 1816.

See also *Psilothra* and *Zoropsis*.

Hersilia Savigny & Audouin 1825, in SAVIGNY: Descr. Egypt. Hist. Nat. 1: 4, 114; *H. caudata* Sav. & Aud. 1825 ibid. from Egypt (♀ no types; ♂ described by KULCZYNSKI 1901; ♂♀ Helsinki). Often listed in Agelenidae before the creation of the family Hersiliidae (THORELL 1870 a), for instance, by C. L. KOCH (1837) and KOCH & BERENDT (1854). Synonym: *Chalinura*. Senior homonym of *Hersilia* Dejean 1835, *Hersilia* Philippi 1839, *Hersilia* Robineau-Desvoidy 1863, and *Hersilia* Monterosato 1884.

Hesperauximus Gertsch 1937, Amer. Mus. Novit. 936, 4; *H. sternitzkii* Gertsch 1937, ibid. f. 104 from California (♂♀ New York; New York – synanthropic) = *Badumna longinquus* (see *Badumna*), n. syn. Synonymized by GERTSCH (in R. MARPLES 1959) with *Ixeuticus martius* (Sim.) 1899, another synonym of *B. longinquus*. Described in Amaurobiidae, listed here in Matachiinae.

See also *Arctobius*.

Hestimodema Simon 1909, Fauna SW-Austr. 2: 12, 166. Originally no generotype was selected, but PETRUNKEVITCH (1928) listed *H. ambigua* Sim. 1909, ibid. from West Australia (♂♀ – ♀ syntypes Paris – Berlin) as such. Described in Clubionidae: Cteninae, but generally listed in Ctenidae: Calocteninae since PETRUNKEVITCH (*loc. cit.*). Transferred here to Zoridae.

H. latevittata Sim. 1909 (♀ syntypes Paris – Berlin) is evidently a Zorid species, too, but it may represent a genus of its own.

Hesydrimorpha Strand 1911, Abh. Senckenb. Naturf. Ges. 34: 2, 168 from Island of Aru, Indonesia (♀ Frankfurt – not seen). Described in Pisauridae, and listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae.

Hesydrus Simon 1898, Ann. Soc. Ent. Belg. 42, 21; *H. palustris* Sim. 1898, ibid. from Ecuador (♂♀ Paris). Described in Pisauridae, and generally listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae.

No specific revision has been carried out.

Heterodictyna Dahl 1907, Zool. Anz. 31, 63 (no generotype). F. DAHL (*loc. cit.*) synonymized *Heterodictyna* Dahl 1904, Sitz.-Ber. Ges. naturf. Fr. Berlin 1904, 118 (no species listed – nomen nudum by this revision) with *Dictynina*. Thus it is also synonymous with the senior, valid synonym of *Dictynina*, *Mallos*, although CHAMBERLIN & GERTSCH (1958) used *Heterodictyna* in quite a different sense (cf. below).

Heterodictyna: Dahl 1924, Verh. Phys.-med. Ges. Würzburg, N. F. 50: 4, 154; listed in combination *H. flavescens* (Walck.) 1825. However, such a use of a generic name that has been previously synonymized with an entirely different genus, is not valid according to the rules of nomenclature. Cf. *Heterodictyna* Dahl 1907. Synonymous with *Nigma*, obj. syn., and *Ergatis*, Sim. 1914 (non Bl. 1841).

Cf. also *Ajmonia* and *Mallos*.

Hicanodon Tullgren 1901, Sv. Exp. Magell. 2: 10, 253; *H. cinerea* Tullg. 1901, ibid. Pl. 19: 9 (♀ ? type Paris). Described in Agelenidae, listed in subfamily Ageleninae since PETRUNKEVITCH (1928). Transferred here to Amaurobiidae: Macrobininae. Synonymous with *Rubrius*, n. syn.

Hickmania Gertsch 1958, Amer. Mus. Novit. 1912, 16; *Theridion troglodytes* Higgins & Petterd 1883, Proc. R. Soc. Tasmania, 191 from Tasmania (Hobart – not seen; ♂ described by HICKMAN 1928; ♂♀ Hobart, ♀ Paris). The generotype was first described in Theridiidae, and it was later transferred to the genus *Ectatosticta* in Hypochilidae by RAINBOW (1904). Selected here as the type genus for family Hickmaniidae. Cf. also GERTSCH (1958 c).

Hilke Keyserling 1887, Verh. zool.-bot. Ges. Wien 37, 444; *H. trivittata* Keys. 1887, ibid. Pl. 6: 17 from California (♀ Cambridge; ♂ described by CHAMBERLIN 1919 sub *Herpyllus oabus*). Described in Drassoidae, transferred to Clubionidae: Liocraninae by SIMON (1897), and synonymized with *Agroeca* by KASTON (1938 b). Cf. also this genus.

Hina Forster 1964, Pac. Ins. Monogr. 7, 85; *Ostearius delli* Forst. 1955, Rec. Domin. Mus. 2: 4, 195 f. 45 – 51 (see *Gasparia*). The generotype was originally described in Linyphiidae: Gonatiinae, and the new genus was listed in Agelenidae. Synonymous with *Gasparia*, n. syn. (Amaurobiidae: Desinae). Junior homonym of *Hina* Gray 1841, *Hina* Marx 1892, and *Hina* Marwick 1927.

Histocona Thorell 1870, N. Acta reg. Soc. Sci. Upsal., 3. Ser. 7, 133; *Agelena torpida* C. L. Koch 1834, in HERRICH-SCHÄFFER: Deutschl. Ins. 125 Pl. 11 from Europe (no types; ♂ described by WALCKENAER 1841 sub *Tegenaria emaciata*, ♀ by C. L. KOCH 1841; Stockholm,

coll. Polenec & PL). Originally assigned to Agalenoidae, usually listed in subfamily Ageleninae since SIMON (1898 a), here in tribus Tegenarini.

Many of the species of this genus have generally been listed under *Tegenaria*. The specific revision of that genus is quite incomplete; thus it is evident that some additional species will be transferred into *Histopona*. The generic affiliation of following species has been checked by myself according to specimens examined: *Tegenaria luxurians* Kulcz. 1897 (♂♀ Budapest – not seen; coll. PL & Polenec), and *T. conveniens* Kulcz. 1914 (♂♀ type preservation unknown; London), while it is highly probable that the following species also belong to *Histopona*: *T. debilis* Thor. 1875 (♀ type preservation unknown), *T. laeta* Kulcz. 1897 (♀ Budapest – not seen), and *T. sinuata* Kulcz. 1897 (♀ Budapest – not seen).

Hololena Chamberlin & Gertsch 1929, Journ. Ent. Zool. Claremont 21: 3, 106 as a subgenus of *Agelena*: *A. mimoides* Chamb. 1919, Ann. Ent. Soc. Amer. 12, 256 Pl. 19: 5 – 6 from Utah (♂ Cambridge; ♀ described by CHAMBERLIN & IVIE 1942 a). Raised to generic rank by EXLINE (1938). Agelenidae: Ageleninae.

A specific revision of this large genus was presented by CHAMBERLIN & IVIE (1942 a). Material of *H. hola* (Chamb. & Gertsch) 1928 (♂♀: New York) examined by myself.

Hoplolathys Caporiacco 1947, Ann. Hist. Nat. Mus. Nat. Hungar. 40: 3, 101: *H. aethiopica* Capor. 1947, ibid. from Ethiopia (♀ types lost). Described in Dictynidae, transferred here to Zodariidae. Most probably synonymous with *Trygetus*, n. syn.

Horiocetus Chamberlin 1916, Bull. Mus. Comp. Zool. Harvard 60: 6, 266: *H. lycosoides* Chamb. 1916, ibid. Pl. 21: 2 – 4 from Peru (♀ Cambridge). Described in Clubionidae, and generally listed in Ctenidae: Calocteninae since PETRUNKEVITCH (1928). Listed here in Zoridae and synonymized with *Odo*.

The status of other species is obscure.

Huanacauria n. gen., p. 315: *Miagrammopes bambusicola* Sim. 1892, Ann. Soc. Ent. France 61, 428 from Venezuela (♂♀ Paris). Uloboridae: Miagrammopinae.

A large Neotropical genus, but the specific revision is not completed. At least the following two species also belong there: *M. trailli* P. P.-Cambr. 1882 (♀ type preservation unknown; Paris) = *H. trailli* n. comb. and *M. albocinctus* Sim. 1892 (juv. ♀ Paris) = *H. albocincta* n. comb.

Huara Forster 1964, Pac. Ins. Monogr. 7, 80: *Gohia antarctica* Berl. 1931, Rec. Canterbury Mus. 3: 6, 359 Pl. 47: 4 – 10 from Auckland Islands adjacent to New Zealand (♂♀ Christchurch – not seen; ♀ Paris). Described in Agele-

nidae, transferred here to Amaurobiidae: Desinae.

The species of this genus have long been known as New Zealandian representatives of the Clubionid genus *Chiracanthium*, and the genotype has previously been listed in Argyronetidae. FORSTER (op. cit.) presented a specific revision of *Huara*, but *Myro ovalis* Hogg 1909 (♀ Dunedin – not seen; non ♂) also seems to belong here. Cf. FORSTER (1964 a, p. 74).

Hygropoda Thorell 1894, Descr. Catal. Spid. Burma, 221 as a nomen novum for *Dendrolycosa*: Thorell 1878, non Doleschal 1859. Genotype through original designation: *H. prognatha* Thor. 1894, Bull. Soc. Ent. Ital. 26, 4 from Singapore (♂♀ type preservation unknown); cf. erroneous citation of genotype by ROEWER (1954 a) and BONNET (1957). Originally assigned to Lycosoidae, but transferred to Pisauridae by SIMON (1898 a), and listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae.

A detailed specific revision of this genus has not yet been carried out, but possibly the Neotropical species belong elsewhere. Material of several Oriental species preliminarily examined (London).

Hylobihoggia Strand 1935, Folia Zool. Hydrobiol. 7: 2, 304 as a nomen novum for *Hylobius* Hogg 1900 (see this genus). Synonymous with *Taurongia*.

Hylobius Hogg 1900, Proc. R. Soc. Victoria. N. S. 13: 1, 82: *H. divergens* Hogg 1900, ibid., Pl. 13: 2 from Victoria, Australia (♀ London) = *H. punctatus* Hogg 1900, ibid., 84 Pl. 13: 3 from Victoria, Australia (♂ juv. ♀ London), n. syn. Described in Amaurobiidae, listed here in Desinae. Synonymous with *Taurongia*, junior homonym of *Hylobius* Germar 1817.

Hypochilus Marx 1888, Ent. Amer. 4, 160: *H. thorelli* Marx 1888, ibid. f. 1 – 3 from Tennessee (♂♀ Washington – not seen; Paris). By description selected as the type genus for Hypochilidae.

The four Nearctic species are all allopatric, and at present it is impossible to know which of them are valid species. I have personally investigated paratype material of *H. petrunkevitchi* Gertsch 1958 (♂♀ New York; Paris), and it seems to be sufficiently different from the genotype, while *H. gertschi* Hoffm. 1963 (♂♀ New York) may be only a geographic race of the genotype and *H. bonneti* Gertsch 1964 (♂♀ New York) of *H. petrunkevitchi*. GERTSCH (1964) recently revised this genus and regarded all these as good species. See also *Ectlosticta*.

Hypodrasodes Dalmas 1919, Bull. Mus. Hist. Nat. Paris 4, 250: *Drassodes maoricus* Dalmas 1917, Ann. Soc. Ent.

France 86, 346 f. 23–25 from New Zealand (♀ Paris). Described in Drassidae, listed in Hypochilidae by BONNET (1957, p. 2257; 1959, p. 5048), evidently a lapsus calami. Gnaphosidae.

Hypoplatea Mac Leay 1838, Ann. Mag. Nat. Hist., 1. Ser. 2, 6 as a subgenus of *Selenops*: *S. celer* MacLeay 1838, ibid. Pl. 6: 2 from the island Bonaire, West Indies (♀ no types). For familial affiliation and status of *Hypoplatea*, see *Selenops*.

Hypsithylla Simon 1903, Ann. Soc. Ent. Belg. 47, 38: *H. linearis* Sim. 1903, ibid. from Madagascar (juv. ♀ Paris – not seen). Described in Pisauridae, and generally listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here as Lycosoidea incertae sedis.

The status of the Oriental species, *H. celebesiana* Str. 1913 is quite obscure.

Hyptiotes Walckenaer 1837, Hist. Nat. Ins. Apt. 1, 275 (*Uptiotes*): *U. anceps* Walck. 1837, ibid. from France (♀, ♂ sub var. *schreberi* – no types) = *Mithras paradoxus* C. L. Koch 1937, in HERRICH-SCHÄFFER: Deutschl. Crust. Myr. Arachn., 123 f. 9 from Germany (no types; ♂♀ Stockholm). For orthography of the generic name, see BONNET (1957, p. 226) Originally assigned to Dysderides, then listed in Theridionidae by DOLESCHAL (1852) and in Agelenidae by AUSSERER (1867). Transferred to Uloboridae by SIMON (1892 a), and later always listed there. Selected as the type genus for the subfamily Hyptiotinae by PETRUNKEVITCH (1928). Synonyms *Cylopodia* and *Mithras* C. L. Koch 1837. *Uptiotes* Walckenaer 1833, is a nomen nudum.

The Nearctic species have recently been revised by MUMA & GERTSCH (1964). Material of *Cylopodia cavata* Hentz 1847 (♀ type preservation unknown; ♂ described by EMERTON 1888; Cambridge & Stockholm) examined. The Palearctic and Oriental species have not yet been revised. See also *Sybota*.

Iamatega Kishida 1955 (? 1928), Acta Arachn. 14: 1, 11 (cf. p. 213): *Tegenaria campestris* C. L. Koch 1834, in HERRICH-SCHÄFFER, Deutschl. Ins. 125 Pl. 35 f. 8 from Germany (no types; ♂♀ described by C. L. Koch 1841). Described in Agelenidae: Ageleninae, tribus Tegenarini. Synonymized here with *Tegenaria*, and even with stricter limitation of genera or possible subgenera certainly synonymous with *Sabitega*.

Iberina Simon 1881, An. Soc. Espan. Hist. Nat. 10, 127: *I. mazarredoi* Sim. 1881, ibid. from

Spain (♂♀ Paris). Described in Agelenidae: Hahniinae, generally listed in Hahniidae since PETRUNKEVITCH (1928). Listed here in subfamily Hahniinae. Senior homonym of *Iberina* Munnier-Chalmas 1902.

The limitation of *Iberina* is here radically altered. *Agelena montana* Bl. 1841 (♀ presumably Oxford; ♂ described by BLACKWALL 1861; ♂♀ Paris & Berlin) = *I. montana* n. comb., *I. candida* Sim. 1875 (♂♀ Paris) = *I. candida* n. comb. *H. spasskyi* Denis 1958 (♂♀ probably Copenhagen) = *I. spasskyi* n. comb., and *H. difficilis* Harm 1966 (♂♀ Frankfurt – not seen) = *I. difficilis* n. comb. For synonyms of the two first species, see HARM (1966). See also *Hahnina*.

Ithurakius R. Marples 1959, Trans. R. Soc. New Zealand 87: 3–4, 359: *I. forsteri* R. Marples 1959, ibid. Pl. 3: 2–3 from New Zealand (♂♀ Christchurch – not seen; ♀ Dunedin + ♂ unpubl. figures of FORSTER) = *Megadictyna thileni* Dahl 1907, Zool. Anz. 31: 2–3, 32 from New Zealand (♀ Berlin), n. syn. (independently secured also by FORSTER, in litt.) Described in Dictynidae, transferred here to Megadictynidae. Synonymous with *Megadictyna*, n. syn. (also FORSTER in litt.)

Ilipula Simon 1903, Ann. Soc. Ent. Belg. 47, 39: *I. anguicula* Sim. 1903, ibid. from Annam, India (♂ Paris – not seen). Described in Pisauridae, and listed in Thaumasiinae by PETRUNKEVITCH (1928) and subsequent authors. Listed here in Dolomedidae.

Incasoctenus Mello-Leitão 1942, Rev. Bras. Biol. Rio de Janeiro 2: 4, 433: *I. perplexus* M.-Leit. 1942, ibid. f. 7 from Peru (♀ type preservation unknown). Described in Ctenidae: Cteninae, position unknown to me.

Intihuatana n. gen., p. 366: *Bigois antarctica* Sim. 1902, Erg. Hamburg. Magalh. Sammlr. 2, Arachn., 40 from Tierra del Fuego (♀ Paris; ♂ described by BIRABÉN 1957: La Plata – not available; ♂♀ syntypes Hamburg – ♀ Paris – in part, non ♂) = *Amaloxenops translata* Schiap. & G.-Pik. 1959, Rev. Soc. Ent. Argentina 21, 132 as a nomen novum for *B. antarctica*: Birabén 1957, n. syn. The above confusion by SCHIAPELLI & GERSCHMAN DE PIKELIN (*op. cit.*) can be explained as follows: The original material of SIMON (*op. cit.*) includes four different species from three samples. Two of them are labelled as *Bigois antarctica*, one in Hamburg, the other in Paris, while the third sample is preserved in Paris and labelled *Hahnina antarctica*. The tube labelled *B. antarctica* in Paris contains a single female of a *Neohahnina* sp., and it was interpreted

as the holotype by GALIANO (in SCHIAPELLI & GERSCHMAN DE PIKELIN *op. cit.*). The sample in Hamburg consists of the true *B. antarctica* only, and it is curious that SIMON did not mention the male at all. The other sample in Paris included only females of *B. antarctica*, but numerous females and males of an undescribed species of *Hahnia* and even a juvenile specimen of an unknown two-clawed spider with rather long spinnerets. Hahniidae: Hahniinae.

Iphinoe Rafinesque 1815, Anal. Nat. Tabl. Univ. Corps organ., 107 as a nomen novum for *Clotho* Walckenaer 1809. This procedure was first made generally known through BONNET (1957, p. 2298), and I will submit a proposition to suppress the generic name *Iphinoe* in favour of *Uroctea*, although it has priority over the latter name, which also is an objective synonym of *Clotho* Walck. 1809. Oecobiidae: Urocteinae. Senior homonym of *Iphinoë* Adams 1854, *Iphinoë* Bate 1856, and *Iphinoë* Spaeth 1898.

Ishania Chamberlin 1925, Bull. Mus. Comp. Zool. Harvard 67, 224: *I. tentativa* Chamb. 1925, *ibid.* from Costa Rica (♂ Cambridge). Described in Agelenidae: Cybaeinae, transferred to Zodariidae by ROTH (1965).

Isoctenus Bertkau 1880, Mém. Class. Sci. 43, 61: *I. foliiferus* Bertk. 1880, *ibid.* from Brasil (juv. ♀ type preservation unknown; ♀♂ described by MELLO-LEITÃO 1936 b). Orthography corrected to *foliifer* by BONNET (1957, p. 2312). Described in Drassidae, but listed in Ctenidae: Cteninae among synonyms of *Ctenus* by PETRUNKEVITCH (1928), and later by MELLO-LEITÃO 1936 b) and BONNET (*loc. cit.*) as an independent genus. I agree with the latter opinion.

A specific revision of *Isoctenus* has not been carried out, but according to a preliminary survey of the descriptions, it is evident that it is a rather large genus, although several species have been listed in *Ctenus*. By contrast, *I. strandi* M.-Leit. 1936 (?) and *I. janeiricus* M.-Leit. 1936 seem to belong to the Caloctenid genus *Anahita*, or to its vicinity, at least.

Itatiaya Mello-Leitão 1915, Broteria 13, 140: *I. modesta* M.-Leit. 1915, *ibid.* from Brazil (♀ type preservation unknown). Described in Clubionidae: Cteninae, and later often listed in Ctenidae: Cteninae since PETRUNKEVITCH (1928). However, BRYANT (1942) transferred this genus into Sparassidae: Micrommatinae. Listed here in Ctenidae incertae sedis. Senior homonym of *Itatiaya* Roewer 1928, *Itatiaya* Schmidt 1932 and *Italiaya* Bechyně 1953.

See also *Trujillina*.

Itatsina Kishida 1930, Lansania 2: 16, 81 (description in Japanese): *Talanites dorsilineatus* Dön. & Str. 1906, in BÖSENBERG & STRAND: Abh. Senck. naturf. Ges. 30, 377 Pl. 7: 84 from Japan (no type specimens – description based on the manuscript and figure of DÖNITZ) = *Agroeca praticola* Bös. & Str. 1906, *ibid.*, 291 Pl. 16: 464 from Japan (♀ Frankfurt – not seen; ♂♀ Osaka II). This synonymy has long been known to Japanese arachnologists (see YAGI-NUMA 1962 a). Described in Clubionidae, transferred here to Liocranidae.

Iviella n. gen., p. 357: *Argenna ohioensis* Chamb. & Iv. 1935, Bull. Univ. Utah, 26: 4, Biol. 2: 8, 26 Pl. 12: 92–94 from Ohio (♂ New York; ♀ described by CHAMBERLIN & GERTSCH 1958). Dictynidae: Tricholathysinae.

Argennina reclusa Gertsch & Iv. 1936 (♀ New York) = *I. reclusa* n. comb. CHAMBERLIN & GERTSCH (1958) listed these species in *Tricholathys*.

Iwogumoa Kishida 1955 (? 1928), Acta Arachn. 14: 1, 11: *Coelotes insidiosus* (see *Coelotes*). Originally assigned to Agelenidae: Ageleninae, tribus Tegenarini, but listed here in Coelotinae. Synonymous with *Coelotes*.

Ixeuticus Dalmas 1917, Ann. Soc. Ent. France 86, 329: *Amaurobius martius* (see *Badumna*). Originally assigned to Dictynidae s. lat., and selected by PETRUNKEVITCH (1939 a) as the type genus of Amaurobiidae: Ixeuticinae. Transferred here into Amaurobiidae: Matachiinae and synonymized with *Badumna*; even if opinions concerning the limitation of this genus differ, *Ixeuticus* remains as a synonym of subgenus *Badumna* s. str.

See also *Forsterina*, *Lathyarcha*, *Maniho*, *Marplesia* and *Oramia*.

Katadysas Hentz 1850, Boston J. Nat. Hist. Soc. 6, 287: *K. pumila* Hentz 1850, *ibid.* Pl. 10: 16 from Alabama (♀ type preservation unknown; ♂ described by KASTON 1948). Orthography of the generic name changed to *Catadysas* by THORELL (1869). Originally assigned to Drassidae, but selected as the type genus for family Catadysoidae by THORELL (*op. cit.*). For later familial affiliation, see *Zora*, which is the current synonymic name.

Kidugua n. gen., p. 346: *K. spiralis* n. sp., p. 407 f. 218 from Congo (♀ Tervuren). Agelenidae: Ageleninae, tribus Tegenarini.

Tegenaria picta Sim. 1870 (♂♀ Paris) = ? *K. picta* n. comb.

Kukulcania n. gen., p. 300: *Filistata hibernalis* Hentz 1842, Boston Journ. Nat. Hist. Soc. 4, 227 Pl. 8: 6 from North America (♂ type preservation unknown; ♀ *ibid.*, 228 Pl. 8: 7 sub *capitata*; ♂♀ Hamburg, det. PL: Berlin & Geneva). Filistatidae.

F. tractans O. P.-Cambr. 1896 (♂ London; ♀ described by O. PICKARD-CAMBRIDGE 1899 sub *capillosa*) = *K. tractans* n. comb., *F. brevipes* Keyserling 1882 (♀ type preservation unknown) = *K. brevipes* n. comb., *F. arizonica* Chamb. & Iv. 1935 (♂♀ New York) = *K. arizonica* n. comb., *F. geophila* Chamb. & Iv. 1935 (♂♀ New York) = *K. geophila* n. comb., *F. utahana* Chamb. & Iv. 1935 (♀ New York) = *K. utahana* n. comb., and *F. hurca* Chamb. & Iv. 1942 (♀ New York) = *K. hurca* n. comb. The last four species at least are closely related to each other and they may be only allopatric races of a single species.

Laches Thorell 1869, N. Acta Reg. Soc. Sci. Upsal., 3. Ser. 7, 37 as a nomen novum for *Lachesis* Savigny & Audouin 1825 (see this genus). Described in Drassoidae, later listed in Agelenidae by O. PICKARD-CAMBRIDGE (1872). For later familial affiliation, see *Lachesana*. Junior homonym of *Laches* Gistel 1848, senior homonym of *Laches* Kaup 1871. Secondary objective synonym of *Lachesana*. For a different opinion of the nomenclatory status of *Laches* Thorell, see BONNET (1957, p. 2339).

Lachesana Strand 1932, Folia Zool. Hydrobiol. 4: 1, 140 as a nomen novum for *Lachesis* Savigny & Audouin 1825 (see this genus). Described in Zodariidae, and also considered by ROEWER (1942) as the valid name for this genus.

Material of *Lachese rufiventris* Sim. 1873 (♂ Stockholm) examined.

Lachese Simon 1873, Mém. Soc. Sci. Liège, 2. Ser. 5, 252 is an unintentional erroneous transcription, referring to *Laches* Thor., and as such this name has no status in zoological nomenclature (ICZN 1964 § 33 b), although BONNET (1957 p. 2339) regarded it as the next valid alternative, should his proposal (BONNET 1951, p. 178) not be accepted, and it was not accepted.

Lachesis Savigny & Audouin 1825, Explic. Planch. Arachn. Savigny Descr. Egypt. 1: 4, 110: *L. perversa* Sav. & Aud. 1825, *Ibid.*, 111 Pl. 1: 4 from Egypt (♂ no types). First assigned to Agelenidae by C. L. KOCH (1837) and later by O. PICKARD-CAMBRIDGE (1872), at least. It was transferred to Enyoidae by THORELL (1873), and later generally listed in the corresponding family Zodariidae, e.g., by SIMON (1893 a). Objective synonym of *Lachesana*, which is here regarded as the valid name for this genus, but renamed three times (cf. *Lestes* Gistel and *Laches* Thor., but also *Lachesel*). Junior homonym of *Lachesis* Daudin 1803, senior homonym of *Lachesis* Risso 1826, *Lachesis* Hagen 1861 (= erroneous transcription of *Lachesilla* Westwood 1840), *Lachesis* Saunders 1871, and *Lachesis* Oberthuer & Houlbert 1922.

Lagenicola Simon 1864, Hist. Nat. Araign., 316: *Altus doumerci* Walck. 1837, Hist. Nat. Ins. Apt. 1, 425 from France (no types – p. 487: cocoon described) = *Agelena brunnea* (see *Agroeca*). Most probably SIMON (1873) himself was aware of the synonymy of *Lagenicola* with

Agroeca, but it was first published by PETRUNKEVITCH (1928). Described in Drassidae, for later familial affiliation, see *Agroeca*.

Lancaria Karsch 1879, Zschr. Ges. Naturw. 52, 557: *Tegenaria torva* O. P.-Cambr. 1869, J. Linn. Soc. London 10, 376 Pl. 11: 10 – 12 & 14 – 20 from Java (♂ London; ♀ described by Pocock 1900; Paris). For synonyms of the generotype, see *Psechrus*, with which the genus was synonymized by SIMON (1892 a). Described in Agelenidae, and transferred to Psechridae by SIMON (*op. cit.*).

Lathargenna Braun 1963, Senck. Biol. 44: 2, 121: *Lathys incerta* Mill. 1943, Ent. List. Brno 6: 5, 11 f. 1 from Czechoslovakia (♀ Brno – ♂ examined) = *Lathys falcigera* (see *Brommella*). Described in Dictynidae, listed here in subfamily Cicuriniinae. Synonymous with *Brommella* (BRAUN 1964).

Lathyarcha Simon 1908, Fauna SW-Austral. 1: 12, 377: *L. tetrica* Sim. 1908, *ibid.* from Western Australia (♀ Paris). Described in Dictynidae, and generally listed in Dictynidae (s. str.) since PETRUNKEVITCH (1928). Transferred here to Amaurobiidae: Matachiinae.

Badumna cinctipes Sim. 1906 (♀ Paris) = *L. cinctipes* n. comb., *Amaurobius inornatus* L. Koch 1872 (♀ Hamburg; ♂ described by DONDALE 1966: Ottawa – not seen; Amsterdam) = *L. inornata* n. comb., and *Ixeuticus vallus* R. Marples 1959 (♂♀ Christchurch – not seen) = *L. vallus* n. comb.

Lathys Simon 1884, Bull. Soc. Zool. France 9, 321 as a nomen novum for *Lethia* Menge 1869: *Ciniflo humilis* Bl. 1855, Ann. Mag. Nat. Hist., 2. Ser. 16, 120 from England (♀ Oxford – not seen; ♂ described by MENGE *op. cit.* sub *Lethia varia*; ♂♀ coll. PL, Stockholm, Helsinki & Berlin) = *Lathys annulata* Bösenb. & Str. 1906, Abh. Senck. Ges. 30: 1 – 2, 110 Pl. 16: 468 from Japan (♀ Frankfurt), n. syn. = *Altella nielsenii* Schenkel 1932, Ent. Tidskr. 53: 4, 206 f. 1 from Öland, Sweden (♀ Basle), n. syn. = *A. lathysoides* Denis, Proc. Zool. Soc. London 1031 Pl. 1: 1 b & c from Algeria (♂ Paris), n. syn. In addition to some geographic variation, there is also remarkable structural variation within the populations of this widespread species. Described in Dictynidae, listed here in subfamily Cicuriniinae. Synonyms: *Analtella* n. syn., *Auximus* n. syn., *Dictyolathys*, *Lethia* (obj. syn.), *Neophanes*, *Prodalia*, and *Scotolathys*. In fact, *Scotolathys* has priority over *Lathys* according to the rules of nomenclature accepted in 1948 (cf. MAYR, LINSLEY &

USINGER 1953, p. 222). GERTSCH (1946 a), as the first reviser, however, synonymized these genera *vice versa* according to the rules of nomenclature from the year 1905. In order to avoid further confusion, I will submit an application to stabilize the synonymization as made by GERTSCH (*op. cit.*). Some of the above synonyms of *Lathys* may be suitable for subgeneric names, but then the corresponding units must be radically redefined, as, for instance, the number and size of eyes is not even a subgeneric character in this genus (cf. GERTSCH *op. cit.*).

The final revision of this genus is one of the most difficult problems of the taxonomy of the Cribellate spiders, because I have observed a considerable infraspecific variation in large samples of some species, including the gradual decrease in size of the anterior median eyes. Most probably several species that have been described will be synonymized when more data about the infraspecific variation has been acquired. The known species are here arranged to groups, but placing of the species without knowledge of the males must be regarded as tentative only. Within each of the groups, the specific revision has not yet been completed. The Nearctic species have been revised by CHAMBERLIN & GERTSCH (1958), but they are also listed here to indicate their grouping.

I. *simplicior* group.

Scotolathys simplicior Dalmas 1916 (♀ Paris). This group seems to be rather deviating, and until the characters of the male are available the probability of a separate genus cannot be disregarded.

II. *narbonensis* group (synonyms: *Analtella* & *Scotolathys*). *Lethia narbonensis* Sim. 1876 (♂ Paris; ♀ described by SIMON 1914: Paris) = *Analtella brevitarsis* Denis 1947 (♀ Paris), n. syn., *Scotolathys simplex* Sim. 1884 (♀ Paris; in part, lectotype selected by myself) = *Lathys simplex* n. comb.

III. *humilis* group.

Lethia sexpustulata Sim. 1878 (♂ Paris; ♀ described by SIMON 1914: Paris – in part, lectoallotype selected by myself), *Lathys brevitibialis* Denis 1955 (♂ type preservation unknown), and *Scotolathys alticola* Denis 1954 (♀ Paris) = *Lathys alticola* n. comb.

IV. *foxi* group (synonym: *Prodalina*)

Prodalina foxii Marx 1891 (♀ types lost; ♂ described by EMERTON 1911 sub *Lathys foxii*; ♂♀ Paris), *Scotolathys delicatulus* Gertsch & Mulaik (♀ New York; ♂ described by GERTSCH & MULAİK 1940), *Lathys heterophthalma* Kulcz. (♀ type preservation unknown; Paris, Warsaw & coll. PL; ♂ described by SCHENKEL 1929: type preservation unknown) = *Scotolathys simplex*: Sim. 1884 (♀ syntypes Paris – in part), n. syn., and *Lathys sylvania* Chamb. ♂ Gertsch 1958 (♀ New York).

V. *affinis* group (synonym: *Dictyolathys*)

Ciniſlo affinis Bl. 1862 (♀ presumably in Oxford; Funchal, Warsaw & Paris; ♂ described by DENIS 1962 a: Paris) = *Lathys atlantica* Denis 1962 (♀ Paris), n. syn., *L. maculina* Gertsch 1946 (n. nov. for *Dictyolathys maculata* Banks 1900: ♀ Cambridge; ♂ described by EMERTON 1913 sub *Scotolathys maculata*; ♂♀ Paris), *Lathys decolor* Kulcz. 1899 (♀ Funchal – Paris; ♂ described by DENIS 1962 a: Paris),

L. immaculata Gertsch 1946 (n. stat. for *Scotolathys maculata immaculata* Chamb. & Iv. 1944 (♂♀ New York).

VI. *denticelis* group (synonym: *Auximus*)

Amaurobius denticelis Sim. 1883 (♂♀ Paris) = *Lathys rubrovittata* Denis 1964 (♂♀ type preservation unknown), n. syn. = *L. alboretromaculata* Denis 1964 (♀ type preservation unknown), n. syn. and *L. albida* Gertsch 1946 (n. nov. for *Scotolathys alba* Chamb. & Iv. 1944 ♂♀ New York).

Lathys lutulenta Sim. 1914 (♀ Paris), *Auximus maurus* Sim. 1910 (♂♀ type preservation unknown) = *L. maura* n. comb., and *L. lepida* O. P.-Cambr. 1909 (♀ type preservation unknown) belong to either group V or VI.

VII. *pallida* group (synonym: *Neophanes*)

Neophanes pallidus Marx 1891 (♂♀ ? cotypes Washington – not seen; New York & Paris).

VIII. *puta* group

Analtella jubata Denis 1947 (♀ Paris) = *Lathys jubata* n. comb., *L. alberta* Gertsch 1946 n. nov. for *L. pallida* Emert. 1894 (♂ Cambridge; ♀ described by GERTSCH *op. cit.* and also sub *Argenna matanaska* by CHAMBERLIN & IVIE 1947 b; New York), *L. dixiana* Ivie & Barrows 1935 (♀ New York), *L. coralynae* Gertsch & Davis 1942 (♂ New York), *Lethia cambridgei* Sim. 1874 (n. nov. for *Dictyna puta*: O. P.-Cambr., ♀ & juv. syntypes Paris – Oxford in part – ♀ specimen in Paris selected as lectoholotype by myself), *Ciniſlo puta* O. P.-Cambr. 1863 (♀ type preservation unknown; Stockholm & Paris; ♂ described by MENGE 1869 sub *Lethia stigmatisata*; Stockholm) = *Lathys taczanowskii* O. P.-Cambr. 1873 (♂ + juv. ♀ Oxford), n. syn. = *Dictyna maculosa* Karsch 1879 (♀ Berlin), n. syn. = *Lathys ocellata* Bös. & Str. 1906 (♀ Frankfurt), n. syn. = *Lathys orientalis* Bös. & Str. 1906 (♂♀ Frankfurt), n. syn. = *Lathys arabs* Sim. 1910 (♂♀ Paris), n. syn. = *Lathys balestrerii* Capor. (♂♀ Florence; Florence – paratypes), n. syn. = *Dictyna bipunctata* Reim. 1935 (♀ Amsterdam), n. syn. = *Lathys subviridis* Denis 1937 (♀ Paris), n. syn. = *Lathys prominens* Mill. 1949 (♂♀ Brno), n. syn. (accepted also by MILLER, pers. comm.). In *L. puta*, there is some geographical variation, but only a few well-defined subspecies.

Lathys novembris Dönitz & Strand 1906 (in BÖSENBERG & STRAND 1906) is a nomen dubium.

See also *Argenna*, *Auximella*, *Brigittea*, *Brommella*, *Callevophthalmus*, *Mexitilla*, *Notolathys*, *Thallumetus*, and *Tricholathys*.

Lauricius Simon 1888, Ann. Soc. Ent. France, 6. Ser. 8, 208: *L. hemicleoninus* Sim. 1888, ibid. from Mexico (♀ Paris; London). Originally assigned into Drassidae, but generally listed in Clubionidae: Clubioninae since SIMON (1897). Transferred here to Miturgidae: Tengellinae.

GERTSCH (1941) has described another species of this genus, *L. hooki* (♂♀ New York).

Leitanoctenus Soares & Camargo 1949, Bol. Mus. Parana. Emilio Goeldi 10, 384: *Mesoctenus spinulosus* M.-Leit. 1929, An. Ac. Bras. Sci. 1: 2, 101 f. 12 from Brazil (♂ type preservation unknown; ♀ described by MELLO-LEITÃO 1936 b). From the original description, the representatives of this genus were believed to be

Ctenid spiders without cribellum, but ROEWER (1954 a) listed it in Acanthoetenidae. In fact, there are both Cribellate and Ecribellate species in this genus, as far as the males are concerned, but probably all the females have a functional cribellum. The oldest available name for this genus is *Nothroctenus*, and here it is listed in Acanthoeteninae.

Leptoctenus L. Koch 1878, Arachn. Austral. 1: 2, 994: *L. agalenoides* L. Koch 1878, ibid. Pl. 87: 1 from Australia (♂ Hamburg). Described in Ctenidae, and always listed in subfamily Cteninae. Often synonymized with *Ctenus*. Listed here in Ctenidae: Acanthoeteninae.

Numerous species from different main regions have been assigned to this genus, but most of them evidently belong elsewhere, while some of the Australian species may be congeneric with *L. agalenoides*. See also *Africactenus*.

Lestes Gistel 1848, Nat. Thierr., IX as a nomen novum for *Lachesis* Savigny & Audouin 1825. Junior homonym of *Lestes* Leach 1815 and *Lestes* Krøyer 1845. Objective synonym of *Lachesana* (see this genus).

Lethia Menge 1869, Schr. Nat. Ges. Danzig, N. F. 2, 249: *L. varia* Menge 1869, ibid. Pl. 47: 145 from Germany (♂♀ types destroyed) = *Ciniflo humilis* (see *Lathys*). Originally assigned to Theridiidae, for later familial affiliation see *Lathys* (obj. synonym.). Junior homonym of *Lethia* Hübner 1816.

See also *Altella* and *Argenna*.

Liocranoides Keyserling 1881, Verh. Zool. Bot. Ges. Wien 31, 291: *L. unicolor* Keys. 1881, ibid. from Kentucky (juv. ♀ Cambridge; ♂♀ New York). Described in Drassoidae, and listed in Clubionidae: Liocraninae, Liocraneae since SIMON (1897). Transferred here to Miturgidae: Tengellinae.

See also *Titiotus*.

Liocranum L. Koch 1866, Arachn. Fam. Drassiden 7, 2. The original description did not include any named species, although it was based on a description that was intended to be published (cf. BONNET 1957, p. 2540). AUSSERER (1867) designated as generotype: *Clubiona domestica* Wider 1834, Mus. Senckenb. 1: 3, 214 Pl. 14: 9 from Germany (♀ no types) = *C. rupicola* Walck. 1830, Faun. Franc. Arachn., 126 from France (♂♀ no types; Paris & Stockholm). Although the genus *Liocranum* itself has never been listed in Agelenidae, its generotype was included within the original limits of

Agelenidae (C. L. KOCH 1837, 1841, 1851 under the names *Tegenaria notata* C. L. Koch 1834 and *Philoica notata*). In fact, a secondary limitation of the genus *Philoica* by C. L. KOCH (1841) excluded its generotype and related species, and left there only the generotypes of the current genera *Agroeca* and *Liocranum*.

SIMON (1897) selected *Liocranum* as the type genus for his Clubionidae: Liocraninae, and since then it has always been listed there. This subfamily is here raised to familial rank. Synonyms *Drapeta* and *Sagana*.

A specific revision of *Liocranum* has not yet been carried out. Material of *Sagana rutilans* Thor. 1875 (♂♀ type preservation unknown; Paris) and *L. majus* Sim. 1878 (♀ Paris) examined. *Liocranum remotum* Bryant 1940 (♀ Cambridge) represents a new Liocranid genus. *L. pulchrum* Thor. 1881 (♀ presumably Genoa) is here transferred outside the groups treated. Probably it is a representative of *Supunna*. See also *Agroeca*, *Cybaeola*, *Mesiotelus*, *Prochora*, and *Syrisca*.

Litisedes Oi 1960, Acta Arachnol. 17: 1, 7: *L. shirahamaensis* Oi 1960, ibid. f. 10 – 15 from Japan (♂♀ Osaka II). Originally assigned to Agelenidae, but listed in Argyronetidae by YAGINUMA (1962 a). Selected here as the type genus for Dictynidae: Litisedinae.

Livius Roth 1967, Bull. Amer. Mus. Nat. Hist. 134: 5, 319: *L. macrospinus* Roth 1967, ibid., Pl. 51: 14 from Chile (♀ New York). Described as a representative of Agelenidae Cybaeinae, but it is here transferred into Amaurobiidae Macrobuninae, in which *Livius* seems to represent the Ecribellate derivative of *Anisacate*.

Lizarba Roth 1967, Bull. Amer. Mus. Nat. Hist. 134: 5, 306: *L. separata* Roth 1967, ibid. Pl. 50: 2 – 3 from Brazil (♀ New York). Described in Agelenidae Ageleninae as a relative of *Mevianes*. It is here transferred into Hahnidae: Cybaeolinae.

Lucia C. L. Koch 1837, Übers. Arachn. Syst. 1, 19: *L. germanica* C. L. Koch 1837, ibid., 20 from Germany (no types; ♀ described by WALCKENAER 1837 sub *Clubiona amussa*, ♂ by C. L. KOCH 1843 sub *Enyo germanica*; ♂♀ Berlin). Described in Drassidae. For later familial affiliation, cf. *Zodariion*, which is the current name of this genus.

Lycaena Sundevall 1832, K. Vet. Ak. Handl. 1832, 266: *L. spinimana* Sundev. 1832, ibid. (see *Zora*). Described in Drassides; for later familial affiliation, see *Zora*, which is the current name of this genus. Junior homonym of *Lycaena* Fabricius 1807 and *Lycaena* Hübner [1819].

Lycodia Sundevall 1833, Consp. Arachn., 22. BONNET (1957, p. 2580) regarded this name as a

typographical error for *Lycaena* Sundevall 1832, but in spite of that he considered it valid, and as such the oldest name for the genus that is generally called *Zora*. In my opinion, SUNDEVALL (1833) could have changed the name on account of homonymy, without giving any argumentation for this change. The only reasonable method of stabilizing the name *Zora* seems to be the official invalidation of the name *Lycodia*. Cf. also *Psilothra*.

Lycotenus F. O. Pickard-Cambridge 1897, Ann. Mag. Hist. Nat., 6. Ser. 19: 98: *Ctenus bogotensis* Keys. 1876, Verh. Zool. Bot. Ges. Wien 26, 684 Pl. 8: 54 from Colombia (♀ London). Described in Lycosidae, and later generally listed in Pisauridae: Thalassinae. Listed here in Ctenidae: Thalassinae. Synonymous with *Acylometes*.

Lycodrassus: L. Koch 1866, Arachn. Fam. Drassiden 2, 2. Only the characters of the genus were listed in comparison with other genera, but no species were listed. Thus *Lycodrassus* was considered a nomen nudum by SIMON (1903 a, p. 974), but a synonym of *Zorocrates* by F. O. PICKARD-CAMBRIDGE (1902, p. 353). The latter author was aware of the fact that the description of *L. robustus* was printed, but never published before that quotation. Described in Drassidae, listed in Clubionidae: Liocraninae by SIMON (1897), and since F. O. PICKARD-CAMBRIDGE (*op. cit.*) in Zoropsidae. Transferred here to Miturgidae: Tengellinae.

Lycodrassus L. Koch 1902, in F. O. PICKARD-CAMBRIDGE: Biol. Centr.-Amer. 2, Aran., 353: *L. robustus* L. Koch 1902, *ibid.* from Mexico (♀ London) = *Zorocrates fuscus* Sim. 1888 (see *Zorocrates*). Described in Zoropsidae as a synonym of *Zorocrates*, transferred here to Miturgidae: Tengellinae.

Lycosoides Lucas 1846, Explor. Sci. Algér., Zool. 1 Arachn., 122. No genotype was selected in the original description, and the six species listed were later transferred to *Zoropsis* (*L. algerica* – listed first) and *Textrix* (*pallipes*, *flavomaculata*, *rufipes*, *rufithorax*, and *digitalis*) by SIMON (1875), and simultaneously the genus *Lycosoides* was considered to be synonymous with *Textrix*. PETRUNKEVITCH (1928) regarded *L. algerica* as the genotype, but agreed with SIMON (*op. cit.*) concerning the synonymy of *Lycosoides* with *Textrix*. BONNET (1957, p. 2673)

was aware of the earlier type designation, but himself suggested a new genotype: *L. flavomaculata* Luc. 1846, *ibid.*, 124 Pl. 4: 2 from Algiers (♂♀ no types; Paris; ♀ Gothenburg). But the synonymization of a genus with no selected genotype with another genus having a genotype seems to fulfil the requirements of the procedure of type designation. Naturally, the genotype of the latter genus then becomes the genotype of the synonymized genus as well. In this case it would be *Textrix denticulata* (see *Textrix*). In order to avoid further confusion, I will submit an application for stabilization of the genotype designated by BONNET (*loc. cit.*).

The genus *Lycosoides* was originally listed after *Lycosa* in a work without family names, and it has generally been listed in Agelenidae: Ageleninae since SIMON (1875). Contrary to the opinion of all other recent authors, it is here listed as an independent genus in the tribus Tetricini. Senior homonym of *Lycosoides* Gourret 1887.

The specific revision of this genus has not been completed, but the generic affiliation of the following species has been checked:

Group I (*flavomaculata*): *T. subfasciata* Sim. 1870 (♀ Paris: ♂ described by DENIS 1954: Paris) = *L. subfasciata* n. comb., *T. parva* Denis 1954 (♀ Paris). *T. albosignata* Sim. 1875 (♂♀ type preservation unknown) probably also belongs here, while *L. digitalis* Luc. 1846 (♂ no types) could even be a senior synonym of *L. parva*, n. comb.

Group II (*variegata*): *T. variegata* Sim. 1870 (♂♀ Paris) = *L. variegata* n. comb. and *T. instabilis* Denis 1954 (♂♀ Paris) = *L. instabilis* n. comb.

Group III (*coarctata*): *Aranea coarctata* Duf. 1831 (♀ no types; ♂ described by H. LUCAS *op. cit.* sub *L. rufipes*; ♂♀ Berlin & Paris; ♀ det PL: Brussels & Vienna) = *T. inornata* O. P.-Cambr. 1872 (♂♀ Oxford – not seen; ♀ Berlin), n. syn., *T. crassivulva* Denis 1954 (♀ Paris) = *L. crassivulva* n. comb.

L. rufithorax Luc. 1846 (♂♀ no types) cannot be exactly placed. *L. pallens* Luc. 1846 (♀ no types) must be transferred outside the family Ageleninae.

Machadonia n. gen., p. 318: *Campostichomma robustum* Sim. 1898, Ann. Soc. Ent. Belg. 42, 7 from South Africa (♀ Paris; ♂ described by LAWRENCE 1942: Pietermaritzburg). Selected here as the type genus for Miturgidae: Machadoniinae.

C. zuluense Lawr. 1938 (♀ Pietermaritzburg) = *M. zuluense* n. comb., *C. natalense* Lawr. 1938 (♀ Pietermaritzburg) = *M. natalense* n. comb., *C. melanum* Lawr. 1938 (♀ Pietermaritzburg) = *M. melanum* n. comb., *C. urbense* Lawr. 1942 (♀ Pietermaritzburg; ♂ undescribed – det. PL: Pietermaritzburg) = *M. urbense* n. comb., *C. punctatum* Lawr. 1942 (♂♀ Pietermaritzburg; ♀ Tervuren) = *M. punctata* n. comb., and *C. disparile* Lawr. 1952 (♂♀ Pietermaritzburg) =

M. disparile n. comb. There are also two undescribed species from South Africa (♂♀ & ♂ Pietermaritzburg).

Macrobunus Tullgren 1901, Sv. Exped. Magell. 2: 10, 248: *M. spinifer* Tullg. 1901, *ibid.* Pl. 5: 5 from Tierra del Fuego (♂ Stockholm) = *Myro backhauseni* Sim. 1896, An. Mus. Nat. Buenos Aires 5, 142 from Patagonia (♂♀ Paris). Described in Agelenidae: Cybaeinae, transferred to Dictynidae (s. lat.) by MELLO-LEITÃO (1940 b), and first listed in Amaurobiidae by ROEWER (1954 a). The generotype was listed by PETRUNKEVITCH (1928) in Dictynidae (s. str.): Myropsisinae. Listed here as the type genus of Amaurobiidae: Macrobininae. Synonyms *Charitonowia*, *Myropsis* Simon 1898, *Olybrius*, n. syn., and ? *Opsaltella*, n. syn. Senior homonym of *Macrobunus* Roewer 1912. This is the only genus revised in which both Cribellate and Ecribellate species have been included.

Myro chilensis Sim. 1888 (♂ Paris), *Myro multidentatus* Tullg. 1905 (♂♀ Stockholm) = *Macrobunus multidentatus* n. comb., *Myro coffe* Sim. 1898 (♀ Paris) = *Macrobunus caffer* n. comb., *Cicurina madrynsensis* Tullg. 1905 (♀ Stockholm – not seen) = *Macrobunus madrynsensis* n. comb., and *Opsaltella diffusa* M.-Leit. 1941 (♀ La Plata – not available) = *M. diffusus* n. comb., also belong to this genus, and the latter may also be synonymous with the generotype. On the other hand, the status of *O. tigrina* M.-Leit. 1941 (♂♀ La Plata – not available) remains unknown for me. There is also an undescribed species from Argentina (♀ Paris) strongly resembling *M. (Olybrius) madrynsensis* Tullg. 1905, but with a well-developed cribellum. See also *Neuquenina*.

Magunia n. gen., p. 388: *Stegodyphus tentorii-cola* Purc. from Capland 1904 (♂♀ Cape Town) = *S. deserticola* Purc. 1908, Denkschr. Med. Nat. Ges. Jena 13, 217 Pl. 11: 5 from Kalahari (♂♀ Berlin), n. syn. Eresidae: Eresinae.

The specific revision of this group is not yet completed, but at least *S. dunicola* Poc. 1898 (♂♀ London) can be listed as *M. dunicola* n. comb.

Maimuna n. gen., p. 349: *Textrix vestita* C. L. Koch 1841 Die Arachniden 8, 52 f. 628–629 from Eastern Mediterranean (♂♀ no types; ♂♀ Berlin & Paris; ♀ Gothenburg). Agelenidae: Ageleninae, tribus Textricini.

T. cretica Kulcz. 1903 (♀ type preservation unknown; Gothenburg & Berlin) = *M. cretica* n. comb., *T. bovier-lapierrei* Kulcz. 1911 (♂♀ type preservation unknown) = *M. bovier-lapierrei* n. comb., and *Agelena deserticola* Sim. 1910 (♀ Berlin – London: in part, non ♂: *Olorunia*) = *M. deserticola* n. comb.

Maitreja n. gen., p. 304: *Oecobius marathaus* Tikad. 1962, J. Bombay Nat. Hist. Soc. 59: 2, 684 f. 2 from India (♀ Calcutta). Oecobiidae: Oecobiinae.

Malaika n. gen., p. 330: *Auximus longipes* Purc. 1904, Trans. S. Afr. Phil. Soc. 15: 3, 132 Pl. 10: 3 from Capland (♂♀ Cape Town). Amaurobiidae: Phyxelidinae.

There is also an undescribed species from South Africa (♀ Paris).

Malalistata Mello-Leitão 1946, An. Ac. Bras. Ci. 18: 1, 47: *Filistata patagonica* M.-Leit. 1938, Rev. Mus. La Plata, N.S. 1, Zool. 4, 90 from the Argentine (♀ La Plata – not available). Filistatidae.

Mallos O. Pickard-Cambridge 1902 Biol. Centr. Amer., Aran. 1, 308: *M. niveus* O. P.-Cambr. 1902, *ibid.* Pl. 35: 1 from Mexico (juv. ♂ London; ♂♀ described by F. O. PICKARD-CAMBRIDGE 1902: London). Dictynidae: Dictyninae. Synonyms: *Coenothele*, *Dictynina*, *Dictynoides*, and *Heterodictyna*, n. syn. (but synonymized with *Dictynina* by F. DAHL 1906).

The Nearctic species have been revised by CHAMBERLIN & GERTSCH (1958) and the Central American ones by GERTSCH (1946 a). Type material of *Dictyna dugesi* Becker 1886 (♀ Brussels; Paris) and *Coenothele gregalis* Sim. 1909 (♂♀ Paris) examined by myself. *Dictyna flavovittata* Keys. 1880 (♀ Vienna; Warsaw) = *D. novempunctata* Sim. 1892 (♀ Paris), n. syn. = *M. flavovittatus* n. comb. See also *Anaxibia* and *Mexillia*.

Malthonica Simon 1898, Hist. Nat. Araign. 2: 2, 258: *M. lusitanica* Sim. 1898, *ibid.* from Spain (♀ Paris; ♂ described by SIMON 1937: Paris). Described in Agelenidae: Ageleninae, listed here in tribus Tegenarini. Cf. also KISHIDA (1955).

M. africana Sim. & Fage 1922 (♀ type preservation unknown) may belong here. See also *Tikaderia*.

Maniho R. Marples 1959, Trans. R. Soc. New Zealand 87: 3–4, 349: *M. tigris* R. Marpl. 1959, *ibid.* Pl. 3: 1 & 5 from New Zealand (♂♀ Dunedin – not seen; Dunedin). Described in Dictynidae (s. lat.), transferred here to Amaurobiidae: Desinae.

Ixeuticus calypso R. Marpl. (♂♀ Dunedin – not seen) probably also belongs here. See also *Forsteria* and *Oramia*.

Marilynia n. gen., p. 359: *Dictyna bicolor* Sim. 1870 (♀ Paris; coll. WIEHLE; ♂ described by CANESTRINI 1873 sub *D. scalaris*; Paris) Dictynidae: Dictyninae.

Marplesia n. gen., p. 329: *Ixeuticus janus* Bryant 1935, Rec. Canterbury Mus. 4: 2, 72 Pl. 12: 19 from New Zealand (♀ Christchurch – not seen; ♂ still undescribed – figures by FORSTER examined). Amaurobiidae: Desinae.

The following species are assigned to this new genus, but I have not personally investigated material of them: *Ixeuticus dalmasi* R. Marpl. 1959 (♀ Dunedin) = *M. dalmasi* n. comb., *I. angustiae* R. Marpl. 1959 (♀ Christchurch) = *M. angustiae* n. comb., and *I. nuntius* R. Marpl. 1959 (♀ Christchurch) n. comb. There is also an undescribed species from New Guinea (♀ Berlin).

Marussenca Dahl 1901, Sitz.-Ber. Ges. naturf. Fr. Berlin 9, 248: *M. madagascariensis* Dahl 1901, ibid. from Madagascar (♂♀ Berlin) = *Uduba dahli* Sim. 1903, Hist. Nat. Araign. 2: 4, 975 as a nomen novum = *U. funerea* Sim. 1906, Ann. Soc. Ent. Belg. 50, 293 from Madagascar (♀ Paris), n. syn. Described in Zoropsidae, transferred to Zorocratidae by F. DAHL (1913). Listed here in Miturgidae: Ulidoninae. Synonymous with *Uduba*.

Marxiellia Mello-Leitão 1917, Arch. Escol. Sup. Agr. 1, 122: *M. fluminensis* M.-Leit. 1917, ibid. from Brasil (♀ type preservation unknown). Originally assigned to Thomisidae, but synonymized with the Pisaurid genus *Dossenus* by MELLO-LEITÃO (1947) himself, and thus listed in Thaumasiinae by ROEWER (1954 a). Listed here in Dolomedidae.

Mashimo n. gen., p. 361: *M. leleupi* n. sp., p. 408 f. 337 from Congo (♀ Tervuren). Dictynidae: Dictyninae.

Mallos difficilis might represent a male of this genus (cf. *Anaxibia*).

Matachia Dalmas 1917, Ann. Soc. Ent. France 86, 328: *M. ramulicola* Dalmas 1917, ibid. f. 1–4 from New Zealand (♀ Paris; coll. B. MARPLES) = *Tegenaria livoris* Urquh. 1892, Trans. N. Zealand Inst. 25, 167 (♂ Christchurch – not seen; coll. B. Marples). Orthography corrected to *livor* by DALMAS (1917). Selected as the type genus for Psechridae: Matachiinae by original description, and transferred to Dictynidae (s. lat.) by B. Marples (1962), who also doubted the subfamilial rank of Matachiinae as limited by DALMAS (*op. cit.*), and later, e.g., by ROEWER (1954 a). Listed here in Amaurobiidae: Matachiinae. Synonym *Urquhartia*.

M. hirsuta B. Marpl. (♂♀ presumably in Dunedin) seems to belong here, although its tracheal distribution is radically different from that of the generotype. See also *Callevophthalmus* and *Dictyna*.

Matundua n. gen., p. 330: *Auximus silvaticus* Purc. 1904, Trans. S. Afr. Phil. Soc. 15: 3, 132 Pl. 10: 2 from Capland (♀ Cape Town) = *A. hottentottus*: Purc. 1908, Denkschr. Med. Nat.

Ges. Jena 13, 216 from Namaqualand, South Africa (♂, ♀ in part: a – Berlin), n. syn., non *A. hottentottus* Poc. 1900. Amaurobiidae: Phyxellidinae.

M. trifoveata n. sp., nomen novum for *A. hottentottus*, Purc. 1908, *op. cit.* (♀ in part: b – Berlin), *A. hottentottus* Poc. 1900 (♀ London) = *M. hottentottus* n. comb.

Megadictyna F. Dahl 1907, Zool. Anz. 31: 2–3, 32: *M. thilenii* F. Dahl 1907, ibid. from New Zealand (♀ Berlin) = *Ihurakius forsteri* R. Marpl. 1959, Trans. R. Soc. New Zealand 87: 3–4, 359 Pl. 3: 2–3 from New Zealand (♂♀ Christchurch; ♀ Dunedin comp. FORSTER + unpubl. fig. by FORSTER), n. syn. (FORSTER in litt.). Orthography corrected to *thileni* by BONNET (1957, p. 2748). Described in Dictynidae, transferred here to the superfamily Thaidoidea and selected as the type genus for the family Megadictynidae. Synonym *Ihurakius*, n. syn. (independently synonymized also by FORSTER in litt.).

There is also an undescribed species in New Zealand (♀ unpubl. fig. by FORSTER in litt.).

Melpomene O. Pickard-Cambridge 1898, Biol. Centr. Amer., Aran. 1, 285: *M. elegans* O. P.-Cambr. 1898, ibid. Pl. 39: 6 from Mexico (♂ London). Agelenidae: Ageleninae, Agelenopsini.

A specific revision of this genus has been presented by CHAMBERLIN & IVIE (1942 a). Material of *M. plesia* Chamb. & Iv. 1942 (♂ New York) and *Agelena coahuilana* Gertsch & Davis 1940 (♀ New York; ♂ undescribed; ♂♀ det. PL: New York) examined. *Novalea bipunctata* Roth 1967 (♀ New York) = *M. bipunctata* n. comb.

Menneus Simon 1876, Bull. Soc. Zool. France 1, 219: *M. tetragnathoides* Sim. 1876, ibid. from Congo (♂ presumably in Paris). Described in Uloboridae, generally listed in Dinopidae since PETRUNKEVITCH (1928).

M. camelus Poc. 1902 (♀ London; det. PL: Berlin) = *M. dromedarius* Purc. 1904 (♀ Cape Town), n. syn. On the other hand, males only are known of *M. affinis* Tullg. 1910 (♂ Stockholm) and the generotype, and it is possible that there is only a single species of *Menneus*.

Mesiotelus Simon 1897, Hist. Nat. Araign. 2: 1, 143: *Cheiracanthium tenuissimum* L. Koch 1866, Arachn. Fam. Drassidae, 237 Pl. 9: 154 from the Mediterranean region (♂ type preservation unknown; ♀ described by PAVESI 1875 sub *Liocranum cerioi*; ♂♀ Paris). Described in Clubionidae: Liocraninae, listed here in Liocranidae.

A specific revision of this obviously large genus has not yet been carried out. Material of *Mesiotelus* sp. (♀ Stockholm) examined. Some species were originally described under *Liocranum* and *Agroeca*, although *Mesiotelus* is seemingly more closely related to *Apostenus*.

Mesoctenus Mello-Leitão 1929, An. Ac. Bras. Ci. 1: 2, 100: *M. sericeus* M.-Leit. 1929, *ibid.* f. 11 from Brazil (♂ type preservation unknown; ♀ described by MELLO-LEITÃO 1936 b – evidently subadult). Originally assigned to Ctenidae, transferred to Acanthothenidae by MELLO-LEITÃO (1936 a), but only 18 days later he listed this genus again in Ctenidae: Acantheinae (1936 b); the generotype was, however, omitted from this latter monograph! Listed here in Ctenidae: Acanthotheninae. Junior homonym of *Mesoctenus* Thomas 1918, synonymous with *Nothroctenus*.

Metafecenia F. O. Pickard-Cambridge 1902, Biol. Centr. Amer., Aran. 2, 357: *M. albolineata* F. O. P.-Cambr. 1902, *ibid.* Pl. 33: 16 – 17 from Mexico (♂ + juv. ♀ London). Described in Psechridae, transferred here to Miturgidae: Tengellinae. Synonymous with *Tengella*, n. syn.

Metaltella Mello-Leitão 1931, An. Ac. Bras. Ci. 3: 2, 94: *M. argentinensis* M.-Leit. 1931, *ibid.* from Argentina (♀ Buenos Aires; Buenos Aires comp. SCHIAPELLI & GERSCHMAN DE PIKELIN) = *Amaurobius iheringi* Keys. 1891, Spinn. Amer. 3, Bras. Spinn., 154 Pl. 4: 107 a – b (non 107!) from Brasil (♂ London – non ♀-syntype), n. syn. = *A. simoni*: Keys. 1877, Verh. Zool. Bot. Ges. Wien 27, 385 Pl. 14: 12 (non 11) (♀♀ syntypes London – Hamburg – non ♀ lectoallotype + ♂ lectoholotype: London; ♂♀ det. PL: Paris), n. syn. = *Auximus segmentatus* M.-Leit. 1943, Rev. Mus. La Plata, N. S. 3, Zool. 20, 103 f. 3 from Argentina (♂ La Plata – not seen; Buenos Aires comp. SCHIAPELLI & GERSCHMAN DE PIKELIN), n. syn. (= *Amaurobius iheringi*: SCHIAPELLI & GERSCHMAN DE PIKELIN in litt.). Thus the generotype must be called *Metaltella iheringi* (Keys.) 1891. Described in Dictynidae (s. lat.), listed by ROEWER (1954 a) in Dictynidae (s. str.). Selected here as the type genus of Amaurobiidae: Metaltellinae. Probably *Aebutinoidea* is a synonym of this genus.

Amaurobius simoni Keys. 1877 (lectoholotype ♂ + lectoallotype ♀ London, non remaining ♀♀ syntypes London – Hamburg) = *A. iheringi*: Keys. 1891 (♀ London – non ♂), n. syn. = *Auximus biseriatus* Tullg. 1905 (♀ Stockholm), n. syn. = *Auximus crispus* M.-Leit. 1941 (♂♀ La Plata – not seen; Buenos Aires comp. SCHIAPELLI & GERSCHMAN DE PIKELIN; ♀ London), n. syn. (independently observed also by SCHIAPELLI & GERSCHMAN DE PIKELIN in litt., regarding *A. simoni*). Sometimes *Amaurobius tristissimus* Holmberg 1874 (♀ presumably no types) has been considered synonymous with this species (MELLO-LEITÃO 1940 a, ROEWER 1954 a), but according to LEVI (1964) HOLMBERG's paper was not

available to authors outside Buenos Aires until he got a microfilm of it (cf. LEVI *op. cit.*, p. 11). In my opinion, the original description of *A. tristissimus* (HOLMBERG 1874, p. 33 – 34) might refer to either of these apparently common representatives of *Metaltella* or even to some *Goeldia*. Therefore I prefer to consider *A. tristissimus* a nomen dubium. *Amaurobius imitans* M.-Leit. 1940 (♂ La Plata – not seen) = *M. imitans* n. comb. may represent a third species because of differences in the eye pattern, while the status of *Aebutinoidea tigrinus* remains obscure.

Mevianes Simon 1904 Ann. Soc. Ent. Belg. 48, 111: *M. delfini* Sim. 1904, *ibid.* from southern Chile (♀ Paris; det. PL: Santiago & Berlin). Described in Agelenidae: Ageleninae, transferred here to Hahniidae: Cybaeolinae. Synonymous with *Cybaeolus*, n. syn.

Mevianops Mello-Leitão 1941, An. Ac. Bras. Ci. 13: 2, 119: *M. fragilis* M.-Leit. 1941, *ibid.* f. 3 – 4 from Colombia (♀ type preservation unknown). Described in Agelenidae, listed in subfamily Ageleninae by ROEWER (1954 a). ROTH (1967 a) supposed that this genus might belong to Zodariidae. In my opinion, it is undoubtedly a close relative to *Cybaeodamus* or even synonymous with this genus.

Mexitlia n. gen., p. 359: *Lethia trivittata* Banks 1901, Proc. Acad. Nat. Sci. Philadelphia 53, 577 Pl. 33: 9 – 10 from New Mexico (♂♀ Cambridge; ♂♀ New York & Paris – comp. Gertsch). Dictynidae: Dictyninae.

Dictyna grandis O. P.-Cambr. 1896 (♀ London; ♂ described by GERTSCH 1946 a) = *M. grandis* n. comb. and *D. avara* Banks 1898 (♀ presumably in San Francisco; London) = *Mexitlia avara* n. comb. All three species have generally been included in *Mallos* since GERTSCH (*op. cit.*).

Mezentia Thorell 1881, Ann. Mus. Civ. Genova 17, 204: *M. angustata* Thor. 1881, *ibid.* from Ternaté Island, Indonesia (♀ syntypes Genoa – Stockholm). For the synonyms of generotype, see *Fecenia*, which is an objective synonym of *Mezentia* Thorell. Described in Agelenidae, later generally listed in Psechridae since SIMON (1892 a). Junior homonym of *Mezentia* Stål 1878.

Miagrammopes O. Pickard-Cambridge 1869, Journ. Linn. Soc. London 10, Zool., 401: *M. thwaitesii* O. P.-Cambr. 1869, *ibid.* Pl. 14: 1 – 12 from Ceylon (♀ presumably in Oxford; juv. ♀ Geneva & Paris; undescribed ♂: Paris). Described in Uloboridae, selected as the type genus for the family Miagrammopidae by O. PICKARD-CAMBRIDGE (1871), but later generally listed in Uloboridae: Miagrammopinae since SIMON (1892 a).

The specific revision of the Oriental-Ethiopian Miagrammopinae is not yet completed, but most probably *Miagrammopes* is a western genus in its distribution when compared with *Ranguma*. *M. sexpunctatus* Sim. 1906 (♀ Paris – un-

described ♂: Paris) certainly belongs to the nominate genus, while *M. extensus* Sim. 1889 (juv. ♀ Paris), and *M. ferdinandi* O. P.-Cambr. 1869 (♀ Oxford – not seen; Paris) are provisionally left there. See also *Huanacauria* and *Mumaia* (Neotropical and Nearctic species).

Microctenus Keyserling 1877, Verh. Zool. Bot. Ges. Wien 26, 687: *M. ornatus* Keys. 1877, ibid. Pl. 2: 62 from Brazil (♀ London). Described in Ctenidae, and generally listed in Cteninae since PETRUNKEVITCH (1928). Objective synonym of *Oligoctenus*, junior homonym of *Microctenus* Fitzinger 1843.

Miltia Simon 1870, Rev. Mag. Zool., 2. Ser. 22, 147: *Enyo amaranthina* Lucas 1846 Expl. Sci. Algerie, Zool. 1, 231 Pl. 14: 7 from Algiers (♀ no types; ♂ described by O. PICKARD-CAMBRIDGE 1872: Oxford – not seen; Berlin). Described in Drassidae, but listed in Filistatides by O. PICKARD-CAMBRIDGE (1872), and later selected as the type genus for the family Miltioidae by THORELL (1873). This family name has since been considered invalid, except by KASTON (1938 a), due to suggested synonymy of *Miltia* with *Prodidomus*, and SIMON (1884b) proposed Prodidomidae as a substitute for Miltioidae. In my opinion, the generic criteria of SIMON, DALMAS (1919), and COOKE (1964) need to be revised, and, consequently, it is highly probable that the genus *Miltia* must be reaccepted, and the generic name *Prodidomus* reserved for the North American species.

Mistaria n. gen., p. 347: *Agelena leucopyga* Pavesi 1884, Ann. Mus. Civ. Genova 20, 41 from Ethiopia (♀ Genoa; ♂ described by SIMON 1909 a; ♀ Frankfurt). Agelenidae, Ageleninae, tribus Agelenini.

ROEWER (1954 b) revised the Ethiopian species of *Agelena*. Among them there are numerous species that must be transferred to *Mistaria*. However, the preliminary examination of large samples from some populations reveals that there is considerable variation of colouration, size, and even in details of genitalia in a few widespread species. Thus no specific revision is presented here, and no actual new combinations are listed, but only a list of species described: *A. lepida* O. P.-Cambr. 1876 (♂♀ Oxford – not seen), *A. dubiosa* Str. (1908 (♀ type preservation unknown), *A. funerea* Sim. 1909 (♀ Paris – not seen), *A. suboculata* Sim. 1910 (juv. ♀ Berlin), *A. annulipedella* Str. 1913 (♀ Berlin), *A. jumbo* Str. 1913 (♂♀ Berlin), *A. zorica* Str. 1913 (♀ Berlin – epigyne lost), *A. littorcola* Str. 1913 (♀ Berlin), *A. kiboschensis* Less. 1915 (♂♀ Geneva – not seen), *A. raymondae* Less. 1915 (♀ Geneva – not seen), *A. hirsutissima* Capor. 1940 (♂ type preservation unknown), *A. nairobi* Capor. 1949 (♂♀ type preservation unknown), *A. fagei* Capor. 1949 (♀ type preservation unknown), *A. keniana* Roew. 1954 (♀ Frankfurt – not seen), *A. moschiensis* Roew. 1954 (♀ Frankfurt – not seen), *A. nyasana* Roew. 1954 (♀ Frankfurt – not seen), *A. longimammillata* Roew. 1954 (♀ Frankfurt – not seen), *A. lawrencei* Roew. 1954 (♀ Frankfurt – not seen), *A. zuluana* Roew. 1954 (♀ Frankfurt – not seen), *A. tenuella* Roew. 1954 (♀ Frankfurt – not seen), and *A. consociata* Denis 1964 (♂♀ Makokou – paratypes examined). Besides, an extensive collection of unidentified representatives of 2–3 good species of *Mistaria* (♂♂♀ Tervuren) has been preliminarily examined.

Mithras C. L. Koch 1837, in HERRICH-SCHÄFFER: Deutschl. Crust. Myr. Arachn., 123: *M. paradoxus* (see *Hyptiotes*). Originally assigned to Epeirides and later often listed there, e.g., by OHLERT (1854) and THORELL (1858), but sometimes even in Agelenides (AUSSERER 1867). Selected as the type genus for the family Mithraides by C. L. Koch (1851). Listed in Uloboridae: Hyptiotinae since SIMON (1892 a). Synonymous with *Hyptiotes*. Junior homonym of *Mithras* Hübner [1818] and *Mythras* Haliday 1829, senior homonym of *Mithras* Agassiz 1846.

Miturga Thorell 1870, Öfvers. K. Vet. Akad. Handl. 27: 4, 376: *M. lineata* Thor. 1870, ibid. from Australia (♂♀ Stockholm; det. PL: Brisbane). Described in Agalenoidae, and listed in subfamily Ageleninae by L. Koch (1872). SIMON (1897) transferred it to Clubionidae: Liocraninae, but separated there the group Miturgeae for *Miturga* and some genera that are, in fact, related to it. *Miturga* is here selected as the type genus for the subfamily Miturginae as well as for the whole family Miturginae.

The generic limitation of Miturginae has not yet been completed, and possibly many of the species that have been originally assigned into this large genus must be transferred into *Prochora* or *Diaplograpta*. Material of *M. agelena* Sim. 1909 (♂♀ Berlin – ?, ♀), *M. catograpta* Sim. 1909 (♀ Berlin), *M. occidentalis* Sim. 1909 (♀ Berlin), *M. severa* Sim. 1909 (♂♀ Berlin), *M. thorelli* Sim. 1909 (♀ Berlin), and *M. whistleri* Sim. 1909 (♀ Berlin) examined.

Miturgina Simon 1888 [1889], Ann. Soc. Ent. France, 6. Ser. 8, 244: *M. vittata* Sim. 1888, ibid. from New Caledonia (juv. Paris). Described in Clubionidae, and usually listed in Ctenidae: Cteninae since PETRUNKEVITCH (1928). Listed here in Zoridae. Synonymous with *Argoctenus*.

Mizaga Simon 1898, Hist. Nat. Arazn. 2: 2, 268: *M. chevreuxi* Sim. 1898, ibid. from Senegal (♀ Paris). Described in Agelenidae: Ageleninae, transferred here to Dictynidae: Tricholathysinae. Synonyms *Desidiopsis* and *Halocryphoea*, n. syn. Cf. also ROTH (1967 c).

Desidiopsis racovitzae Fage 1909 (♂♀ Paris; Vienna) = *Halocryphoea veneta* Capor. 1934 (♀ presumably in Trieste), n. syn. = *M. racovitzae*.

†*Mizalia* Koch & Berendt 1854, in BERENDT: Die im Bernstein befindlichen organischen Reste der Vorwelt 1: 2, 42. THORELL (1870 a) selected *M. rostrata* Koch & Ber. 1854, ibid., 44 Pl. 5: 33 from Baltic amber (♂ types lost) as the generotype. Described in Theridiidae, but listed by MENGE (1856) in Clubionidae (s. lat.). THORELL (*op. cit.*) selected this genus as the type of the family Mizalioidae and placed it in the vicinity of Uroctidae. Most probably this

family must be transferred to Filistatoidea, but its exact position remains obscure to me. *Myzalia* Berendt 1845 is a nomen nudum.

Mnesitheus Thorell 1899, Bih. Sv. Vet. Ak. Handl. 25: 4 (1), 18: *M. asper* Thor. 1899 from The Cameroons (♀ Stockholm). Described in Dictynidae, transferred to Zoropsidae by F. DAHL (1901 a), and further by himself (F. DAHL 1913) to Tengellidae. PETRUNKEVITCH (1928) first listed it in the subfamily Calamistrulinae. Transferred here to Miturgidae: Ulidoniinae. Synonymous with *Raecius*, n. syn.

Moguracicurina Komatsu 1947, Biosphaera 1: 1, 8: *M. honesta* Kom. 1947, ibid., 9 + 7 figs. from Japan (♂♀ type preservation unknown) = *Tetrilus japonicus* Sim. 1881 (see *Tetrilus*). Described in Agelenidae: Ageleninae, transferred here to Dictynidae: Cicuriniinae. Synonymous with *Cicurina*.

Muizenbergia Hewitt 1915, Ann. Natal Mus. 3: 2, 291: *M. abrahami* Hewitt 1915, ibid. f. 1 a – g from Capland (♂♀ Grahamstown – not seen; ♀ Pietermaritzburg). Described in Agelenidae, but sometimes listed in Hahniidae, for instance, by ROEWER (1954 a, 1954 b). Listed here in Hahniidae: Hahniinae, closely related with *Hahnina*. Synonyms *Hahniops*, *Simonida*, and *Scotussa* Sim. 1898, all n. syn.

The specific revision presented below is final only as regards the limitation of *Muizenbergia*, while some of the species may fall to synonyms.

Scotussa zodarioides Sim. 1898 (♀ Paris) = *M. zodarioides* n. comb., *Hahnina tabulicola* Sim. 1898 (♂♀ Paris) = *H. laticeps*, Sim. 1898 (♀ Paris), n. syn. = *M. tabulicola* n. comb., *H. clathrata* Sim. 1898 (♀ Paris) = *M. clathrata* n. comb., *H. oreophila* Sim. 1898 (♂♀ Paris) = *M. oreophila* n. comb., *H. schubotzi* Str. 1913 (♂♀ originally Berlin – lost?); ♀ London; det PL: ♂ Tervuren) = *H. macrovulva* Str. 1913 (♀ originally Berlin – lost?), n. syn. = *M. schubotzi* n. comb., *H. rouletti* Less. 1915 (♂♀ Geneva – not seen; det PL: Tervuren) = *M. rouletti* n. comb., *H. annulata* Less. 1915 (♂♀ Geneva – not seen; juv. ♀ Paris) = *M. annulata* n. comb., *H. crozetensis* Hickm. 1939 (♂♀ type preservation unknown; Paris) = *M. crozetensis* n. comb., *Hahniops eidmanni* Roew. 1954 (♀ Frankfurt – not seen) = *M. eidmanni* n. comb., and *H. kaestneri* Roew. 1954 (♀ Frankfurt – not seen – paratype London) = *M. kaestneri* n. comb.

Mumaia n. gen., p. 395: *Miagrammopes corticeus* Sim. 1892, Ann. Soc. Ent. France 61, 427 from Venezuela (♂♀ Paris). Uloboridae: Miagrammopinae.

The specific revision of this group is incomplete. *Miagrammopes albo guttatus* F. O. P.-Cambr. 1902 (♀ London) = *Miagrammopes nevermanni* Reim. 1939 (♀ Vienna), n. syn. = *Mumaia albo guttata* n. comb., *Miagrammopes scoparius* Sim. 1891 (♂♀ London) = *Mumaia scoparia* n. comb., *Miagram-*

mopes ciliatus Petr. 1926 (♀ type preservation unknown) = *Mumaia ciliata* n. comb., *Miagrammopes birabeni* M.-Leit. 1945 (♂ La Plata – not available) = *Mumaia birabeni* n. comb., and *Miagrammopes mexicanus* O. P.-Cambr. 1893 (♀ London) = *Mumaia mexicana* n. comb.

Mynoglenes Simon 1905, Zool. Jahrb., Syst. 21: 4, 419: *M. insolens* Sim. 1905, ibid. from Chatham Islands, adjacent to New Zealand (♂♀ Paris). Described in Agelenidae and listed in subfamily Cybaeinae by PETRUNKEVITCH (1928), ROEWER (1954 a and BONNET (1957). However, HICKMAN (1939) transferred it to Linyphiidae. Cf. also the opinion of BERLAND (1931). Listed here in Linyphiidae and selected by myself as the type genus for the subfamily Mynogleninae, which is especially characterized by the presence of numerous metatarsal trichobothria and the exceptional type of modification of the carapace. – *M. incerta* Bryant 1935 (♀ Christchurch – not seen) may belong to Amaurobioidea.

Mynthes Simon 1887, Miss. Sci. Cap Horn 6, E 16. No generotype was designated in the original description, nor, as the genus was synonymized by SIMON (1902) with *Rubrius*, has the designation been done since. *Clubiona ambigua* Nic. 1849 was transferred to *Calacadia* by EXLINE (1960) and *C. breviventris* Nic. 1849 considered here a nomen dubium. Thus only a single species originally included in *Mynthes* remains: *Coelotes castaneifrons* Sim. 1884, Bull. Soc. Zool. France 9, 124 from Hoste Island, adjacent to Tierra del Fuego (♀ Paris; ♂ described by SIMON 1898 a: Paris). This is the generotype by elimination. Described in Agelenidae: Cybaeinae, transferred here to Amaurobiidae: Macrobulinae. Synonymous with *Rubrius* (cf. this genus).

Myro O. Pickard-Cambridge 1876, Proc. Zool. Soc. London, 263: *M. kerguelensis* O. P.-Cambr. 1876, ibid. Pl. 19: 5 from Kerguelen (♂♀ London; Berlin, Frankfurt & Oslo; det PL: Paris) = *M. jeanneli* Berl. 1941, Mém. Mus. Hist. Nat. Paris, N.S. 20, 57 f. 1 – 6 from Crozet Island, Antarctic Ocean (♀ Paris; Oslo), n. syn. = *M. paucispinosus* Berl. 1941, ibid., 59 f. 7 – 13 from Marion Island, Antarctic Ocean (♀ Paris; Oslo), n. syn. Described in Agelenidae, generally listed in subfamily Cybaeinae since SIMON (1898 a). Transferred here to Amaurobiidae: Desinae, but it may represent a distinct group as well, together with some other subantarctic genera (cf. p. 327). See also GERTSCH (in SAVORY 1960).

M. maculatus Sim. 1903 (♀ Paris) and *M. manningi* Forster 1964 (♂♀ Honolulu – not seen) certainly belong to this genus, while the position of *M. kirki* Hogg 1909 (♂♀ type preservation unknown), and *M. ovalis* Hogg 1909 (♂ Dunedin – not seen, non ♀: Huara) remains obscure. For *Myro frigidus* Brist. 1931 (♂♀ type preservation unknown; Oslo)

see TAMBS-LYCHE (1954). See also *Eocryphoea*, *Huara*, *Macrobunus*, and *Rubrius*.

Myropsis Simon 1898, Hist. Nat. Araign. 2: 1, 238: *Myro backhauseni* Sim. 1896 (see *Macrobunus*). Described in Dictynidae (as a foot-note to the description of Agelenidae: Cybaeinae), and selected as the type genus for the subfamily Myropsisinae by PETRUNKEVITCH (1928). In spite of that, ROEWER (1954 a) listed this genus in Amaurobiidae. Transferred here to Amaurobiidae: Macrobininae. Synonymous with *Macrobunus*, jun. homon. of *Myropsis* Stimpson 1870.

See also *Neuquenina*.

Naevius Roth 1967, Bull. Amer. Mus. Nat. Hist. 134: 5, 320: *Cybaeus varius* Keys. 1880, Verh. Zool.-Bot. Ges. Wien 29, 319 Pl. 19 & 19 a from Peru (♂♀ Warsaw – not seen). Originally assigned into Agelenidae: Cybaeinae, transferred here into Amaurobiidae, most probably a relative of *Porteria* in Desinae.

Namandia n. gen., p. 325: *Rubrius periscelis* Sim. 1903, Ann. Soc. Ent. Belg. 47, 35 from Tasmania (♂ Paris). Amaurobiidae: Matachiinae, related to *Forsterina*.

Nambia Kishida?: *N. fasciculata* Kish.?. Description totally Japanese, and thus a nomen nudum. Cited by YAGINUMA (1960) as a representative of Hahniidae.

Namopsilus Chamberlin 1920, Journ. Ent. Zool. Claremont 12, 14: *N. pletus* Chamb. 1920, ibid. Pl. 6: 1 from California (♂ type preservation unknown) = *Parauximus tardatus* Chamb. 1920, ibid., 3 Pl. 1: 2 from California (♂ type preservation unknown). Included in the genus *Cybaeus* by CHAMBERLIN & IVIE (1937). Described in Clubionidae: Liocraninae, generally listed in Agelenidae: Cybaeinae, listed here in Dictynidae: Cybaeinae.

Nannonymphaeus Rainbow 1920, Rec. S. Austr. Mus. 1, 260: *N. pusillus* Rainb. 1920, ibid. Pl. 30: 86–91 from Lord Howe Island, adjacent to eastern Australia (♂ Adelaide). Described in Agelenidae, later generally listed in Hahniidae since PETRUNKEVITCH (1928). Listed here in subfamily Hahniinae. Synonymous with *Alistra*, n. syn.

Neonagraphis Gertsch & Mulaik 1936, Amer. Mus. Novit. 851, 11: *N. chamberlini* Gertsch & Mulaik 1936,

ibid. f. 15 from New Mexico (♂ New York). Described in Gnaphosidae, but transferred to Clubionidae to the vicinity of *Liocranoides* and *Syspira* by GERTSCH (1941). Later listed in subfamily Liocraninae by ROEWER (1954 a). Listed here in Clubionidae s. str.

There is also another species, *N. pearcei* Gertsch 1941 (♂ New York).

Neoantistea Gertsch 1934, Amer. Mus. Novit. 712, 19: *Hahnia agilis* Keys. 1887, Verh. Zool.-Bot. Ges. Wien 37, 465 Pl. 6: 29 from North America (♂♀ presumably Vienna; Urbana). Hahniidae: Hahniinae.

The numerous Nearctic and Neotropical species described in this genus seem to fit well with the definition of the genus. These species are listed by GERTSCH (1946 b), ROEWER (1954 a, p. 106–107) and PAIK (1958). Material of *Hahnia riparia* Keys. 1887 (♂♀ type preservation unknown; ♀ Paris) examined.

H. glacialis Sørensen 1898 (♂♀ Copenhagen I; ♀ Paris) = *N. glacialis* n. comb., *H. rectispina* Kulcz. 1926 (♂ presumably Warsaw) = *N. rectispina* n. comb., and *H. monticola* Bryant 1940 (♀ Cambridge) = *N. monticola* n. comb. Thus there are also two Palearctic species in *Neoantistea* (*N. rectispina* and *N. quelpartensis* Paik 1958).

Neoaviola Butler 1929, Proc. R. Soc. Victoria, N. S. 42: 1 (6), 45: *N. insolens* Butler 1929, ibid. Pl. 1: 6–8 from Victoria, Australia (♀ Melbourne). Hahniidae: Hahniinae.

The generic affiliation of *N. wellingtoni* Hickm. 1948 (♂♀ Hobart – not seen; paratypes coll. Hickman) has been confirmed. Probably *Hahnia solitaria* Bryant 1935 (♀ Christchurch – not seen) and *H. hickmani* Forster 1964 (♀ Honolulu – not seen) must be transferred to *Neoaviola*.

Neohahnia Mello-Leitão 1917, Arch. Escol. Sup. Agr. Med. Vet. 1, 17: *N. sylviae* M.-Leit. 1917, ibid. from Brazil (♀ type preservation unknown). Originally assigned to Agelenidae, but listed in Hahniidae since GERTSCH (1934), here in subfamily Hahniinae.

The status of this genus has always been rather obscure, although GERTSCH (*op. cit.*) suggested close relationship between *Neohahnia* and the Neotropical species then included in *Bigois*. The redescription of *Neohahnia* is here mainly based on *Hahnia ernesti* Sim. 1897 (♂♀ ? syntypes Paris – London in part; det. PL: Paris & Hamburg, from all parts of the Neotropical region) = *N. ernesti* n. comb., non *Hahnia ernesti* Petr. 1929, and *H. veracruzana* Gertsch & Davis 1940 (♂ New York) = *H. veracruzana* n. comb. On the other hand, the generic affiliation of *N. palmicola* M.-Leit. 1917 (♀ type preservation unknown) is quite uncertain.

Neomalachia Hickman 1950, Proc. R. Soc. Victoria, N. S. 60, 2: *N. tubicola* Hickm. 1950, ibid. f. 1–5 from Reevesby Island, adjacent to Southern Australia (♂♀ Melbourne – not seen; ♀ coll. Hickman). Described in Psechridae:

Matachiinae, transferred to Dictynidae (s. lat.) by B. MARPLES (1962). Transferred here to Amaurobiidae: Matachiinae. Synonymous with *Paramatachia*.

Neophanes Marx 1891, Proc. Ent. Soc. Washington 2: 1, 6: *N. pallida* Marx 1891, *ibid.*, 34 Pl. 1: 4 a–f from northeastern United States (♂ ♀ cotypes Washington – not seen; New York & Paris). Described in Dictynidae, listed here in subfamily Cicuriniinae. Synonymous with *Lathys*, but seems to be available for a subgeneric name.

Neoporteria Mello-Leitão 1943 Rev. Chil. Hist. Nat. 45, 140: *N. pracellens* M.-Leit. 1943, *ibid.* f. 5 (*N. precipua* in the index, p. 136!) from Chile (♀ type preservation unknown). Described in Agelenidae, listed in subfamily Ageleninae by ROEWER (1954 a). Transferred here to Amaurobiidae: Macrobininae.

N. annulata Roth 1967 (♂ ♀ New York) probably is very closely related with the generotype.

Neotegenaria Roth 1967, Bull. Amer. Mus. Nat. Hist. 134: 5, 312: *N. agelenoides* Roth 1967, *ibid.* Pl. 51: 1 from Guyana (♀ Cambridge – not seen). Agelenidae: Ageleninae.

Neuquenina Mello-Leitão 1940, Rev. Mus. La Plata, N. S. 2, Zool. 9, 12: *N. pallida* M.-Leit. 1940, *ibid.*, 13 f. 14 from Argentina (♀ La Plata – not available). Described in Dictynidae, transferred here to Macrobinidae: Altellopsinae. Senior homonym of *Neuquenina* Rehn 1943 and *Neuquenina* Köhler 1952.

Myropsis pauperculus Sim. 1905 (♀ Paris) = *N. pauper-cula* n. comb. Possibly it is synonymous with the generotype. There is also an undescribed species (♀ Berlin).

Nicodamus Simon 1887 Ann. Soc. Ent. France, 6. Ser. 7, Bull., CXCIV as a nomen novum for *Centropelma* L. Koch 1871 (see this genus). Described in Theridiidae, and listed there still by ROEWER (1954 a) and BONNET (1959). On the other hand, SIMON (1898 a, p. 221) selected it as the type genus for Agelenidae: Nicodaminae. LEVI & LEVI (1962) transferred this genus into Zodariidae. I have personally investigated material of *Ozaleus tarandus* Thor. 1889 (♂ ♂ Stockholm) and *Nicodamus* sp. (♂ ♀ Berlin), and I agree with LEVI & LEVI (*op. cit.*) that *Nicodamus* is a relative of Zodarids rather than either Theridids or Agelenids, but it may represent a family of its own in the superfamily Zodarioidea. Synonyms: *Centropelma* L. Koch 1871 and *Ozaleus*.

Nigma n. gen., nomen novum for *Heterodictyna*: Dahl 1924 (non *Heterodictyna* Dahl 1907). Generotype: *Drassus flavescens* Walck. 1825, Faun. Franc., Aran., 179 from France (♂ ♀ no types; Helsinki, Stockholm, Paris, Berlin & Warsaw) =

Dictyna orientalis Kulcz. 1895, Termesz. Füzetek 18, 34 Pl. 1 f. 22 – 23 from Caucasia (♀ type presumably lost), n. syn. = *D. tristis* Spassky, Entom. Obozr. 32, 202 f. 5 from Tadzikistan (♀ type preservation unknown) n. syn. Dictynidae: Dictyninae. Synonyms *Ergatis* Sim. 1914 (non Blackwall 1841) and *Heterodictyna* Dahl (cf. above). The genus is here limited more strictly than *Heterodictyna* by CHAMBERLIN & GERTSCH (1958).

Dictyna conducens O. P.-Cambr. 1876 (♂ ♀ Oxford) = *N. conducens* n. comb., *D. hortensis* Sim. 1870 (♂ ♀ Paris) = *N. hortensis* n. comb., *D. gertschi* Berl. & Mill. 1940 (♂ ♀ Paris) = *N. gertschi* n. comb., *D. longipes* Berl. 1914 (♂ ♀ Paris) = *N. longipes* n. comb., *D. walckenaeri* Roew. 1951 (as a nomen novum for *Aranea viridissima* Walck. 1802; ♂ ♀ no types Stockholm, Paris & Berlin) = *D. laeta* Spassky 1952 (♀ type preservation unknown), n. syn. = *N. walckenaeri* n. comb., *D. puella* Sim. 1870 (♂ ♀ Paris; Funchal, Florence, Stockholm, Warsaw & Oxford) = *N. puella* n. comb., and *D. shiprai* Tikad. 1965 (♂ ♀ Calcutta) = *D. rebai*: TIKADER 1965 (♂ Calcutta – non ♀: *Anaxibia*), n. syn. = *N. shiprai* n. comb.

Nothroctenus Badcock 1932, Journ. Linn. Soc. London 38, Zool., 31: *N. stupidus* Badc. 1932, *ibid.* f. 33 from Paraguay (juv. ♀ London). Described as an Ecribellate representative of Ctenidae: Acantheinae and always listed there. This revision has placed it among Cribellate spiders, and *Nothroctenus* is transferred to subfamily Acanthotheninae. Synonyms *Mesoctenus* M.-Leit. 1929 and *Leitanoctenus*, both new.

Following species are here transferred to this genus: *Acanthoctenus marshii* F. O. P.-Cambr. 1896 (♀ type preservation unknown; Basle & Paris; ♂ described by MELLO-LEITÃO 1936 a; ♂ ♀ det. PL: London, Berlin & Hamburg) = *A. impar* F. Dahl 1901 (♀ Berlin), n. syn. = *A. saraensis* Str. 1910 (♀ Berlin – non ♂: *Viracucha andicola*), n. syn. = *N. marshii* n. comb. It is highly probable that the generotype is also conspecific with this widespread and common species.

Mesoctenus sericeus M.-Leit. 1929 (♀ type preservation unknown) = *N. sericeus* n. comb., *M. omega* M.-Leit. 1929 (♂ ♀ type preservation unknown) = *N. omega* n. comb., *M. spinulosus* M.-Leit. 1929 = *N. spinulosus* n. comb. *Acanthoctenus lineatus* Tullg. 1905 (♂ Stockholm – non ♀: ? *Cupiennius*) = *N. lineatus* n. comb.

N. bahiensis M.-Leit. 1936 (♂ Rio de Janeiro – not seen) is possibly synonymous with either of the last-mentioned two species.

Notolathys Mello-Leitão 1920, Rev. Soc. Bras. Sci. 3, 171 as a subgenus of *Lathys*: *L. subdifficile* M.-Leit. 1920, *ibid.* from Brazil (♀ type preservation unknown), orthography corrected to *subdifficilis* by BONNET (1958, p. 3118). MELLO-LEITÃO (1926) later raised it to generic rank. Described in Dictynidae, transferred here to Amaurobiidae: Macrobininae. Synonymized here with some doubts with *Auximella*, n. syn.

Novalena Chamberlin & Ivie 1942, Ann. Ent. Soc. Amer. 35: 2, 225: *Agelena intermedia* Chamb. & Gertsch 1930, Proc. Biol. Washington 43, 143 Pl. 5: 28 from California (♂ New York; ♀ described by EXLINE 1938 sub *Hololena*: New York). Agelenidae: Ageleninae.

A specific revision of this genus has been published by CHAMBERLIN & IVIE (1942 a). See also *Melpomene*.

Nukuhiva Berland 1835, Pacif. Ent. Surv. Publ. 8: 4, 63: *Dolomedes adamsoni* Berl. 1933, ibid. 7: 3, 68 f. 55 – 59 from Marquesas Islands, Polynesia (♀ type preservation unknown). Originally assigned to Pisauridae: Thaumasiinae, listed here in Dolomedidae.

Nurscia Simon 1874, Arachn. France 1, 235: *N. albosignata* Sim. 1874, ibid. from Iran (♂ Paris; ♀ described by KRONEBERG 1875 sub *Amaurobius longipalpus*: Stockholm; ♂♀ Berlin & Vienna) = *N. flavipes* Sim. 1874, ibid. from Cyprus (♂ Paris), n. syn. = *Euxinella strandi* Drenski 1938, Festschr. Strand 4, 571 Pl. 9: 1 – 7 from Bulgaria (♂♀ Sofia – not seen), n. syn. Described in Dictynidae (s. lat.), generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Transferred here to Titanoecidae. Synonyms *Boroamia* and *Euxinella* Drenski 1938, both n. syn.

The *albomaculata* group of *Titanoeca* is here transferred to *Nurscia*, but they could be separated as subgenus of their own (cf. p. 382). *Epeira albomaculata* Lucas 1846 (♀ no types; ♂ described by CANESTRINI 1868 sub *Amaurobius XII-maculatus*? types: Genoa; ♂♀ Helsinki, Stockholm, Paris, Basle, Geneva & Vienna) = *N. albomaculata* n. comb., *Titanoeca albofasciata* Strand 1907 (♂ originally Stuttgart – destroyed; det. PL: ♀ + juv. ♂ Berlin) = *Boroamia psechroides* Kish. 1931 (♂ no types), n. syn. (synonymized with the following species by YAGINUMA in litt.) = *T. nipponica* Yagin. 1959 (♂♀ Osaka II), n. syn. = *N. albofasciata* n. comb., and *T. sequeirai* Sim. 1892 (♂♀ Paris) = *N. sequeirai* n. comb. Cf. also HUBERT (1966).

Nydia Thorell 1890, Ann. Mus. Civ. Genova 30, 133: *N. punctata* Thor. 1890, ibid. from Sumatra (juv. ♀ presumably in Genova). Cf. *Anahita*, which is the valid name of this genus.

Nyssus Walckenaer 1805, Tabl. Aran., 52: *N. coloripes* Walck. 1805, ibid. Pl. 6: 57 – 58 from Australia (no types). C. L. KOCH (1837) included this genus in Agelenidae, and it has often been listed there even as late as by BONNET (1958, p. 3120). SIMON (1864) transferred several species of *Agelena* and *Tegenaria* to *Nyssus*, but later he suggested that the latter must be included in Clubionidae: Micariinae as a probable synonym of *Supunna* (SIMON 1897, p. 168). I agree with the latter opinion, except that the genus *Supunna* must be transferred to Corinnidae or related families and, in any case, far from Micariinae.

Material of *Liocranum albopunctatum* Hogg 1896 (♀ London) and some related species examined for placing of *Supunna*.

Obatala n. gen., p. 337: *O. armata* n. sp., p. 407, f. 175 from Capland (♀ Tervuren). Amaurobiidae: Macrobininae.

Odo Keyserling 1887, Verh. Zool. Bot. Ges. Wien 37, 454: *O. lenis* Keys. 1887, ibid., 455 f. 36 from Nicaragua (♀ Cambridge). Originally assigned to Drassoidae to the vicinity of *Zora*, but listed in Clubionidae: Cteninae by SIMON (1897), and later usually in Ctenidae: Calocteninae. Listed here in Zoridae. *Diactenus* and *Horioclenus* are here synonymized with *Odo*.

This large genus is not yet finally revised, but *O. pulcher* Keys. 1891 (♂♀ London), non M.-Leit. 1936 (♀ fig. 52), *O. similis* Keys. 1891 (♂♀ London), and *O. limitatus* Gertsch & Davis 1940 (♀ New York) certainly belong to this genus, as do probably most of the Neotropical species, while the Australian species must apparently be transferred to other Zorid genera. See also *Odomasta* and *Trujillina*.

Odomasta Simon 1909, Fauna SW-Austral. 2: 12, 167: *Odo guttipipes* Simon 1903, Ann. Soc. Ent. Belg. 47, 29 from Tasmania (♂ Paris). Described in Clubionidae: Cteninae, and listed in Ctenidae: Calocteninae since PETRUNKEVITCH (1928). Listed here in Zoridae; rather closely related to *Hestimodema*.

Oecobius Lucas 1846, Explor. Sci. Algér., Zool. 1 Arachn., 101: *O. domesticus* Luc. 1846, ibid. Pl. 2: 1 from Algiers (♂♀ no types; Paris) = *Clotho cellariorum* Dugès 1836, Ann. Sci. Nat., 2. Ser. 6, 161 from the Mediterranean region (no types). Selected as the type genus for the family Oecobiidae by BLACKWALL (1862), but sometimes included in Uroctidae: Oecobiinae (e.g., by CHAMBERLIN & IVIE 1935), and even in Amaurobiidae by WAGNER (1888). Listed here in Oecobiidae: Oecobiinae. Synonym *Phanerecobius*.

Many of the Oecobid species described up to date have been characterized according to colour characters only, and as the type material of most of them has remained unavailable to me, no complete specific revision has been possible in this context. However, the revision of Nearctic and Neotropical species will soon be presented by SHEAR (pers. comm.).

O. templi O. P.-Cambr. 1876 (♂♀ Oxford – not seen), *Phanerecobius formosensis* Kish. 1943 (type preservation unknown), and *O. rhodiensis* Kritscher 1966 (♂♀ Vienna – not seen) at least seem to be closely related to the generotype.

See also *Ambika*, *Maitreja*, *Omanus*, *Platoecobius*, *Tarapaca*, and *Thalamia*.

Oligoctenus Simon 1887, Ann. Soc. Ent. France, 6. Ser. 7, Bull., CLXXXVI as a nomen novum for *Microctenus* Keyserling 1877 (see this genus).

Although most authors have synonymized *Oligoctenus* with *Ctenus* as first presented by SIMON (1897), numerous species have been described under this generic name. A specific revision has not been possible, but the following species are transferred to this genus: *C. medius* Keys. 1891 (♀ London; ♂ described by F. O. PICKARD-CAMBRIDGE 1897: London) = *O. medius* n. comb., *C. vehemens* Keys. 1891 (♀ London) = *O. vehemens* n. comb., and *C. gynheraldicus* M.-Leit. 1936 (♀ type preservation unknown) = *O. gynheraldicus* n. comb.

Olorunia n. gen., p. 346: *O. punctata* n. sp., p. 408 f. 214 from Congo (♂ Tervuren). Agelenidae: Ageleninae.

Agelena ocellata Poc. 1900 (♂♀ London) = *O. ocellata* n. comb. = *A. deserticola*: Sim. 1910 (♂, ♀ in part – Berlin, ♀ in part: *Maimuna deserticola*) = *O. simoni* n. sp. – *Agelena gaerdesi* Roew. 1954 (♀ presumably Frankfurt) probably also belongs here.

Olybrius Roth 1967, Bull. Amer. Mus. Nat. Hist. 134: 5, 323: *Cicurina madrynsensis* Tullg. 1901, Sv. Exp. Magell. 2: 10, 251 Pl. 4: 10 a & b from Central Argentina (♀ Stockholm). Described as a representative of Agelenidae: Cybaeinae, but transferred here to Amaurobiidae: Macrobininae and synonymized with *Macrobonus* (cf. this genus).

Omanus Thorell 1870, N. Acta Reg. Soc. Sci. Upsal., 3. Ser. 7, 114: *Oecobius navus* Bl. 1859, Ann. Mag. Nat. Hist., 3. Ser. 4, 226 from Madeira (type preservation unknown) = *Oecobius annulipes* Lucas 1846, Explor. Sci. Algér., Zool. 1 Arachn., 102 Pl. 2: 2 from Algeria (♀ no types; ♂ described by O. PICKARD-CAMBRIDGE 1872 sub *Oecobius teliger*: Oxford – not seen; ♂♀ New York, Stockholm, Urbana, Santiago, ♀ Helsinki) = *Thalamia parietalis* Hentz 1850, Journ. Boston Soc. Nat. Hist. 6, 35 Pl. 4: 16 from Alabama (♀ type preservation unknown) (GERTSCH 1949, but unknown to ROEWER 1954 a) = *Omanus maculatus* Keys. 1891, Spinn. Amer. 3 (Bras. Spinn.), 160 Pl. 5: 112 from Brazil (♀ London = *Oecobius keyserlingi* Roew. 1951, n. nov.), n. syn. = *Tiroecobius niponicus* Kishida 1947 (see *Tiroecobius*) (YAGI-NUMA 1962 a) = *Oecobius hortensis* Lawr. 1952, Ann. Natal Mus. 12: 2, 185 & 225 f. 5 – 6 & 77 – 78 from Natal, South Africa (♂♀ Pietermaritzburg), n. syn. = *Thalamia annulipes* n. comb.

Selected as the type genus for the family

Omanoidae by original description, but transferred back to Urocteoidae by THORELL (1873, p. 602) himself, and later generally listed in Oecobiidae as a synonym of *Oecobius*. Synonymous with *Thalamia*.

Ommatauxesis Simon 1903, Ann. Soc. Ent. Belg. 47, 37: *O. macrops* Sim. 1903, ibid. from Tasmania (♀ Paris). Described in Agelenidae: Cybaeinae, transferred here to Amaurobiidae: Desinae.

Ommathadites Kishida (? 1928) 1955, Acta Arachn. 14: 1, 10 (cf. p. 236): *Hadites myops* Simon 1885, Ann. Soc. Ent. France, 6. Ser. 5, 212 from Greece (♀ Paris). Described in Agelenidae: Tetrichinae, tribus Haditini, but listed here in Ageleninae, tribus Tegenarini. Synonymized here with *Hadites*, junior synonym of its subgenus *Roeweriana*.

Operaria Blackwall 1841, Ann. Mag. Nat. Hist., 1. Ser. 6, 229 without selection of genotype. The name was published together with *Cavator* (see this genus), and it must be regarded as an objective synonym of *Ergatis* Blackwall 1841. For familial affiliation, see *Dictyna*, which can also be regarded as an objective (and valid) synonym of *Operaria*.

Opsaltella Mello-Leitão 1941, Rev. Mus. La Plata, N.S. 2, Zool. 12, 114: *O. diffusa* M.-Leit. 1941, ibid., 115 Pl. 3: 9 + f. 13 from the Argentine (♀ La Plata – not available). Described in Dictynidae (s. lat.), listed by ROEWER (1954 a) in Dictynidae (s. str.), transferred here to Amaurobiidae: Macrobininae. Synonymous with *Macrobonus*, n. syn.

Oramia Forster 1964, Pacif. Ins. Monogr. 7, 59: *Amaurobius rubrioides* Hogg 1909, Subantarct. Isl. New Zealand, Spid., 159 Pl. 7: 2 from Snares Island, adjacent to New Zealand (♂ Dunedin – ♀ described by HOGG, ibid. sub *Badumna scylla*; ♂♀ Dunedin & Paris). Previously known species of this genus have usually been listed in *Ixauticus* (see this genus), for instance, by DALMAS (1917) and R. MARPLES (1959: *charybdis* group) or *Rubrius*. Transferred here to Amaurobiidae: Matachiinae.

FORSTER (1964 a) presented a synonymic list of the species assigned to this genus by himself and described several new species. In my opinion, it is not quite certain whether each of the populations of fairly similar structure but isolated in

the different subantarctic groups of islands adjacent to New Zealand must be regarded as different species or not. Unfortunately, I have personally investigated only material of *Amaurobius charybdis* Hogg 1910 (♂ type preservation unknown; ♀ described by R. MARPLES 1959: Dunedin – not seen; ♂♀ Dunedin), *Amaurobius chathamensis* Sim. 1899 (♀ Paris: ♂ described by FORSTER 1964 a – not seen), and *Amaurobius frequens* Rainb. 1920 (♀ Adelaide) = *O. frequens* n. comb. It is possible, that *Maniho gracilis* R. Marpl. 1959 (♀ Dunedin – not seen; unpublished figures by FORSTER ♂♀) also belongs here.

Orinomana Strand 1934, Folia Zool. Hydrobiol. 6: 2, 273 as a nomen novum for *Orinomus* Chamberlin 1916 (see below).

Orinomus Chamberlin 1916, Bull. Mus. Comp. Zool. Harvard 60: 6, 207: *O. lamprus* Chamb. 1916, ibid. Pl. 8: 1 – 4 from Peru (♀ Cambridge). Described in Uloboridae: Uloborinae, here in Hyptiotinae. Synonymous with *Petrunkévitchia*, n. syn., junior homonym of *Orinomus* Attems 1895.

Orithya Blackwall 1858, Ann. Mag. Nat. Hist., 3. Ser. 2, 331: *O. williamsi* Bl. 1858, ibid. from the tropics (♀ no types) = *Aranea geniculata* Oliv. 1789 (see *Zosis*). Uloboridae: Uloborinae. Synonymous with *Zosis*. Junior homonym of *Orithya* Fabricius 1798 (= err. transcr. of *Orithuja* Weber 1795), *Orithya* Johnston 1836, and *Orithya* Agassiz 1846 (= etymol. corr. for *Orythia* Péron & Lesneur 1810).

Ozaleus Thorell 1890, Ann. Mus. Civ. Genova, 2. Ser. 8, 293: *O. tarandus* Thor. 1890, ibid., 294 from Australia (♂♀ ? part of series of syntypes Stockholm). Described in Theridiidae. For later opinions, see *Nicodamus*, which is the current name of this genus.

Pacificana Hogg 1904, Ann. Mag. Nat. Hist., 7. Ser. 13: 73, 66: *P. cockayni* Hogg 1904, ibid. f. 1 from Bounty Island, adjacent to New Zealand (♀ Dunedin – London – latter examined). Described in Agelenidae and generally listed in subfamily Cybaeinae since PETRUNKEVITCH (1928). Transferred to Amaurobioididae by FORSTER (1955 a) and listed here in Miturgidae: Amaurobioidinae.

Pagomys Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 15: *P. uinta* Chamb. 1948, ibid. Pl. 3: 34 – 36 from Utah (♂♀ New York) = *Argenna monticola* Gertsch & Iv. 1936, Amer. Mus. Novit. 851, 2 f. 2 from New Mexico (♀ New York). Described in Dictynidae, listed here in subfamily Cicurinae. Synonymous with *Brommella*, junior homonym of *Pagomys* Gray 1864.

Palaestina O. Pickard-Cambridge 1872, Proc. Zool. Soc. London 1872, 268: *P. expolita* O. P.-Cambr. 1872, ibid. 269 Pl. 13: 6 from Israel (♂ Oxford). Described in Agelenidae, transferred to Zodariidae by SIMON (1893 a).

Material of *P. dentifera* O. P.-Cambr. 1872 (♂♀ Oxford) also examined. *P. sexoculta* O. P.-Cambr. 1872 (♀ Oxford) was later transferred to *Trygetus* (SIMON 1893 a). Cf. also *Ilopolathys*.

Palicanus Thorell 1897, Ann. Mus. Civ. Genova 37, 226: *P. caudatus* Thor. 1897, ibid., 227 from Burma (♂ presumably in Genoa). Described in Drassoidae, but generally listed in Clubionidae: Liocraninae since SIMON (1898 a). The position of this genus remains somewhat obscure, but most probably it is not a representative of Liocranidae, but rather a deviating representative of Miturgidae, possibly most closely related to the mainly Neotropical subfamily Eutichurinae.

Palpimanus Dufour 1820, Ann. Gén. Sci. Phys. 6, 364: *P. gibullus* Duf. 1820, ibid. Pl. 69: 5 from the Mediterranean region (no types; ♂♀ described by AUDOUIN 1827 sub *Platyscelum savignyi* – no types; Berlin & Stockholm). Orthography corrected to *gibbulus* by H. LUCAS (1840). Assigned to Attides by C. L. KOCH (1837), included in original description of Eresidae (C. L. KOCH 1851), and consistently listed there until O. PICKARD-CAMBRIDGE (1871) raised THORELL's (1870 a) Eresid subfamily to family rank. Synonyms *Chersis*, *Eumechanus*, and *Platyscelum*, which are all objective synonyms of each other.

Pandava n. gen., p. 381: *Amaurobius laminatus* Thor. 1878, Ann. Mus. Civ. Genova 13, 168 from Ambon, Indonesia (♂ Genoa) = *A. castaneiceps* Sim. 1893, Ann. Soc. Ent. France 62, 69 f. 1 from the Philippines (♂ Paris), n. syn. = *Titanoeca birmanica* Thor. 1895, Descr. Catal. Spid. Burma, 62 from Burma (♂♀ Genoa – Stockholm), n. syn. = *A. taprobanicola* Strand 1907, Abh. naturf. Ges. Görlitz 25, 110 f. 50 a from Ceylon (♀ originally Stuttgart – destroyed; paratypes Warsaw), n. syn. = *A. chinensis* Strand 1907, ibid., 113 f. 50 b from southern China (♀ originally Stuttgart – destroyed), n. syn. = *T. fulmeki* Reim. 1927, Misc. Zool. Sumatra 13, 1 f. 1 from Sumatra (♂♀ Vienna), n. syn. = *Syrorisa mumfordi* Berl. 1933, Pacif. Ent. Surv. Publ. 7: 3, 69 f. 60 – 62 from Marquesas Islands. Polynesia (♀ Paris – London), n. syn. The genotype and all its synonyms have been described in Amaurobiidae or Dictynidae (s. lat.), but the new genus is assigned to Titanocidae.

There is hardly any geographic variation in the populations examined from different parts of the range of this widespread species, *Pandava laminata*.

Papakula Strand 1913, Abd. Senckenb. Naturf. Ges. 34: 2, 166: *P. niveopunctata* Strand 1913, ibid., 167 Pl. 5: 59 from Aru Island, Indonesia (♂♀ Frankfurt – not seen). Described in Pisauridae, and listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae.

Paracanthois Kraus 1955, Abh. Senckenb. Naturf. Ges. 493, 51: *P. virginea* Kraus 1955, ibid. Pl. 8: 134–137 from El Salvador (♂♀ Frankfurt – not seen) = *Acanthothenus spinipes* Keys. 1876, Verh. Zool. Bot. Ges. Wien 26, 695 Pl. 8: 61 from Central America (♀ London; ♂ described by F. O. PICKARD-CAMBRIDGE 1897: London; ♀ Basle & Paris), n. syn. Originally assigned to Ctenidae: Acantheinae as an Ecribellate genus, transferred here to Acanthotheninae. The presence of cribellum has been overlooked by KRAUS (*op. cit.*) as the holotype male is poorly preserved. Synonymous with *Acanthothenus*, n. syn.

Paradesis Pocock 1898, Bull. Liverp. Mus. 1, 75: *P. tubicola* Poc. 1898, ibid. f. 1–3 from South Africa (♀ Liverpool – not seen) = *Robsonia formidabilis* O. P.-Cambr. 1890, Proc. Zool. Soc. London, 625 Pl. 53: 5 from Capland (♂♀ London; Vienna). This synonymy was stated by HIRST (1925), but it has been neglected both by ROEWER (1954 a) and BONNET (1956). Described in Desidae and listed here in Amaurobiidae: Desinae. However, it has generally been listed in Agelenidae: Cybaeinae since SIMON (1898 a). Synonymous with *Desis*.

Paradossenus F. O. Pickard-Cambridge 1903, Proc. Zool. Soc. London 1903, 155: *P. nigricans* F. O. P.-Cambr. 1903, ibid. Pl. 14: 6–9 from Brazil (♂♀ London). Originally assigned to Pisauridae, and listed in Thaumasiinae since PETRUNKEVITCH (1928), Listed here in Dolomedidae.

A specific revision has not yet been carried out.

Paratellopsis Mello-Leitão 1925, Bol. Mus. Nac. Rio de Janeiro 1: 6, 455 as a nomen novum for *Altellopsis* Mello-Leitão 1924 (see this genus). Synonymous with *Ciniflrella*. Described in Dictynidae (s. lat.), transferred here to Amaurobiidae: Metaltellinae.

Paramatachia Dalmas 1918, Bull. Soc. Ent. France 87, 350: *P. decorata* Dalmas 1918, ibid. from Queensland (♂♀ Paris). Described in

Psechridae: Matachiinae, transferred to Dictynidae (s. lat.) by B. MARPLES (1962). Listed here in Amaurobiidae: Matachiinae. Synonym: *Neomatachia*.

B. MARPLES (*op. cit.*) described three additional species and the male of *Neomatachia tubicola* Hickm. 1950 (♀ Melbourne – not seen; ♂♀ Hobart).

Parapostenus Lessert 1923, Rev. Suisse Zool. 30: 6, 190: *P. hewitti* Less. 1923, ibid. f. 36–37 from South Africa (♂ type preservation unknown). Originally assigned to Clubionidae: Liocraninae, position somewhat obscure, but most probably a representative of Miturgidae: Machadoniinae.

Parasyrisca Schenkel 1963, Mém. Mus. Nat. Hist. Nat., N. S., Zool. 25: 1, 261: *P. potanini* Sch. 1963, ibid., 262 fig. 148 from Kuku-nor region, China (♂ Paris). Originally assigned into Clubionidae, listed here provisionally in Miturgidae: Miturginae.

Paratetrilus Kishida 1955 (? 1928), Acta Arachn. 14: 1, 6 (cf. p. 236): *Tetrilus lucifugus* Simon 1898, Ann. Soc. Ent. Belg. 42, 9 from Pyrenees, Southwestern Europe (♀ Paris). Described in Agelenidae: Cicurinae, tribus Tetrilini, but listed here in Hahniidae: Cryphocinae. Synonymous with *Tuberta*. Cf. also *Giltayia*.

Paratus Simon 1898, Hist. Nat. Araign. 2: 2, 209: *P. reticulatus* Sim. 1898, ibid. from Ceylon (♀ Paris): Originally assigned to Clubionidae: Liocraninae. Position quite obscure, but certainly not a representative of Liocranidae.

Paratyle Simon 1896, Ann. Soc. Ent. Belg. 40, 402: *P. silvestris* Sim. 1896, ibid. from Venezuela (♂ Paris), Originally assigned to Clubionidae: Liocraninae. Transferred here into Miturgidae: Eutichurinae.

Parauximus Chamberlin 1920, Journ. Ent. Zool. Claremont 12: 1, 3: *P. tardatus* Chamb. 1920 (see *Namopsilus*). Described in Agelenidae, later synonymized with *Cybaeus* by CHAMBERLIN (1924) in subfamily Cybaeinae. Listed here in Dictynidae: Cybaeinae.

Paravulsor Mello-Leitão 1922, Arch. Escol. Sup. Agr. 6: 1–2, 37 *P. impudicus* M.-Leit. 1922, ibid., 38 from Brazil (♀ type preservation unknown). Originally assigned to Clubionidae, and listed there, e.g., by BONNET (1958), although listed in Ctenidae: Cteninae by ROEWER (1954 a). However, not mentioned by MELLO-LEITÃO (1936 b) himself in the revision of Brazilian Ctenids. Position quite obscure.

Paro Berland 1941, Mém. Mus. Hist. Nat. Paris 20, 22: *P. simoni* Berl. 1941, ibid. f. 9 a–f from Rapa, Polynesia (♀ type preservation unknown). Described in Agelenidae:

Cybaeinae, and transferred to Linyphiidae by B. MARPLES (1964). Listed here in subfamily Mynogleninae. Cf. also *Mynoglenes*.

†**Paruroctea** Petrunkevitch 1942, Trans. Conn. Acad. Arts Sci. 34, 193: *P. blauvelli* Petr. 1942, ibid. Pl. 50: 465–469 & 69: 618 from amber deriving from the Oligocene (juv. ♀ Ithaca – not seen; ♂ described by PETRUNKEVITCH 1958: Berlin – not seen). Described in Urocteiidae, listed here in Oecobiidae: Urocteiinae.

Pelidida Simon 1898, Hist. Nat. Araign. 2: 2, 270: *P. albidida* Sim. 1898, ibid. from Brazil (♂ Paris – not seen). Described in Agelenidae: Ageleninae, listed in Asemosterinae by KISHIDA (1955), and transferred to Linyphiidae: Eriogoninae by ROTH (1965).

Penestomus Simon 1902, Ann. Soc. Ent. France 71, Bull., CCXLI: *P. planus* Sim. 1902, ibid. from South Africa (♀ Paris). Described in Eresidae, and selected by SIMON (1903 a) as the type genus for the subfamily Penestominae.

Petrunkevitchia Mello-Leitão 1915, Broteria 13, 129: *P. venusta* M.-Leit. 1915, ibid., 130 from Brazil (♂ type preservation unknown). Described in Uloboridae, and listed in Miagrammopinae by MELLO-LEITÃO (1917). Generally listed in Uloborinae since PETRUNKEVITCH (1928). Transferred here to Hyptiotinae Synonyms *Orinomana* and *Orinomus* Chamberlin 1916, both new.

P. pusilla M.-Leit. 1917 (♂ type preservation unknown) evidently is not congeneric with *P. venusta*, but its correct position remains obscure.

Phanerecobius Kishida 1943,?: *P. formosensis* Kish. 1943,? The first reference to this genus is unknown to me, but LEE (1966) figured the genotype and synonymized this genus with *Oecobius*, as has also been done by YAGINUMA (in litt.). Evidently this name is a nomen nudum, due to entirely Japanese description.

Phanotea Simon 1896, Ann. Soc. Ent. France 65, Bull., CCLXXXVI: *P. peringueyi* Sim. 1896, ibid. from South Africa (subad. ♀ Paris). Described in Agelenidae: Cybaeinae, transferred here to Miturgidae: Machadoniinae.

A specific revision of this genus has been published by LAWRENCE (1952 a). It is not certain whether the male of the genotype (Pietermaritzburg) described by him is conspecific with the female holotype. Material of all other species also examined: *P. natalensis* Lawr. 1952 (♂♀ Pietermaritzburg; det. PL: Tervuren), *P. simoni* Lawr. 1952 (♀ Pietermaritzburg – paratype subad. ♀), and *P. latebricola* Lawr. 1952 (♀ Pietermaritzburg).

Phantyna Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 15: *Dictyna micro*

Chamb. & Iv. 1944, ibid. 35: 9, Biol. 8: 5, 119 f. 175–177 from Florida (♂♀ New York; Paris). Dictynidae: Dictyninae. Synonym *Varyna*, n. syn. However, it is only a matter of opinion whether *Varyna* is a subgenus or a distinct genus. CHAMBERLIN & GERTSCH (1958) included both *Phantyna* and *Varyna* in *Dictyna*.

The Nearctic species of this genus have been described and figured in detail by CHAMBERLIN & GERTSCH (*op. cit.*, p. 53–61: *micro*, *varyna*, *rita* and *bicornis* groups), but the new combinations are briefly listed here: *Dictyna mulegensis* Chamb. 1924 (♂♀) = *P. mulegensis* n. comb., *D. segregata* Gertsch & Mul. 1936 (♂♀) = *P. segregata* n. comb., *D. varyna* Chamb. & Gertsch 1958 (♂♀) = *P. varyna* n. comb., *D. bicornis* Emert. 1915 (♂♀) = *P. bicornis* n. comb., *D. terranea* Ivie 1947 (♂♀) = *P. terranea* n. comb., *D. rita* Gertsch 1948 (♂♀) = *P. rita* n. comb., *D. pixi* Chamb. & Gertsch 1958 (♂♀) = *P. pixi* n. comb. and *D. provida* Gertsch & Mul. 1936 (♂♀) = *P. provida* n. comb.

The following Neotropical species are also transferred to *Phantyna*: *D. mandibularis* Tacz. 1874 (♀ Warsaw) = *D. parietalis* O. P.-Cambr. 1896 (♂♀ London) = *P. mandibularis* n. comb., *D. guanica* Gertsch 1946 (♀ New York) = *P. guanica* n. comb., *D. remota* Banks 1924 (♂♀ Cambridge) = *P. remota* n. comb., *D. estebanensis* Sim. 1906 (♂ Paris) = *P. estebanensis* n. comb.

Philisca Simon 1884, Bull. Soc. Zool. France 9, 129: *P. hahni* Sim. 1884, ibid. Pl. 3: 14 from the Island Hoste, adjacent to Tierra del Fuego (♀ type preservation unknown). Described in Drassidae: Clubioninae, later generally listed in Clubionidae: Clubioninae since SIMON (1897). The status of the genotype is obscure, but most species described as representatives of this genus seem to belong to Miturgidae: Eutichurinae. Synonym *Cluilus*.

Material of *P. filixnotata* M.-Leit. 1938 examined (♀ London – no type – det. MELLO-LEITÃO).

P. colulata Hogg 1913 (♀ London) obviously is a two-clawed derivative of Amaurobiidae: Macrobininae.

Phillyra Hentz 1850, Boston Journ. Nat. Hist. Soc. 6, 25. Originally two species were included: *P. mammeata* Hentz 1850, ibid, Pl. 3: 16 from Alabama (♀ types lost) and *P. riparia* Hentz 1850, ibid., 26 Pl. 3: 17 from Alabama (♂ types lost), representing both sexes of the same species, *Epeira glomosa* Walck. 1841, Hist. Nat. Ins. Apt. 2, 143 from Georgia (description based on a drawing by Abbot, manuscript, vol. 15 f. 77). For the complicated additional synonymy of this species, see MUMA & GERTSCH (1964, p. 21). Uloboridae: Uloborinae. Synonymous with *Uloborus*.

Philoeca C. L. Koch 1837, Uebers. Arachnidensyst. 1, 13: *Araneus domesticus* Cl. 1757 (see *Tegenaria*). Although the genotype was

designated by original description, there has been much confusion concerning the limitation of this genus (see THORELL 1870 a, p. 130). For orthography of the generic name, see BONNET (1958 a, p. 3588). Originally assigned to Agelenides, and later generally listed there, but in Drassides by THORELL (1858). Synonymous with *Tegenaria*.

See also *Agroeca*, *Cicurina*, *Histoipona*, *Liocranum*, and *Lycosoides*.

Philoicides Mello-Leitão 1944, Rev. Mus. La Plata, N. S., Zool. 3: 24, 335: *P. pallidus* M.-Leit. 1944, ibid. f. 21 from Argentina (♀ La Plata – not available). Described in Agelenidae, and listed in subfamily Ageleninae by ROEWER (1954 a). The description is poor, and the genus remains provisionally in this position until additional data are acquired.

Philoponella Mello-Leitão 1917, Arch. Escol. Sup. Agr. 1, 7 as a subgenus of *Uloborus*: *U. republicanus* Sim. 1891, Ann. Soc. Ent. France 60, 12 Pl. 3: 1 & 4: 1 from Venezuela (♂♀ Paris; numerous museums). Uloboridae: Uloborinae. Raised here to generic rank.

The specific revision of this widespread genus is far from complete, and the synonymic list concerning the generotype has been omitted here, although it is evident that numerous Neotropical species described up till now are only individual colour forms of this highly variable species. For the same reason, new combinations are cited only for some distinctly deviating species. Material of the following species has been investigated:

Neotropical: *Tetragnatha lunaris* C. L. Koch 1839 (♀ no types, Paris), *Uloborus servulus* Sim. 1892 (♂♀ Paris), *U. semiplumosus* Sim. 1892 (♀ Paris), *U. semiargenteus* Sim. 1893 (♀ Paris), *U. variegatus* O. P.-Cambr. 1898 (♀ London; ♂ described by GERTSCH & MULAİK 1940: New York), *U. vicinus* O. P.-Cambr. 1899 (♀ London) & *U. signatellus* Roew. 1851 (n. nov. for *U. signatus* O. P.-Cambr. 1898 ♂♀ London, non *U. signatus* O. P.-Cambr. 1876 ♂ type preservation unknown), and *U. socialis* Hingston 1932 (♀ London).

The following Neotropical and Nearctic species are preliminarily transferred to this genus according to original description only: *U. collinus* Keys. 1883 (♀), *Orinonus lamprea* Chamb. 1916 (♀) *U. niger* M.-Leit. 1917 (♀), *U. festivus* M.-Leit. 1917 (♀), *U. fasciatus* M.-Leit. 1917 (♀), *U. oweni* Chamb. 1924 (♀), *U. cuminiensis* M.-Leit. 1930 (♀), *U. arizonicus* Gertsch 1936 (♂♀), *U. tingens* Chamb. & Iv. 1936 (♀), *U. abstrusus* Gertsch & Davis 1942, and *U. lactescens* M.-Leit. 1947 (♂♀).

Oriental: *U. raffrayi* Sim. 1891 (♂♀, ♀ in part only Paris; Stockholm) = *U. tristis* Kulcz. 1908 (♀ Warsaw), n. syn., *U. mollis* Thor. 1895 (♀ Genoa), *U. truncatus* Thor. 1895 (♀ Stockholm – Genoa) = *U. nasutus* Thor. 1895 (♂ Genoa), n. syn., *U. hilaris* Sim. 1906 (♀ Paris), *U. emarginatus*: Kulcz. 1908 (♀ Warsaw, non lectoholotype = *U. quadrituberculatus* Thor. 1892) & *U. gibberosus* Kulcz. 1908 (juv. Warsaw; Paris).

Australian: *U. variabilis* Keys. 1887 (♀ London) and *U. congregabilis* Rainb. 1916 (♂♀ Melbourne; Adelaide).

Ethiopian: *U. angolensis* Less. 1933 (♂ Geneva; ♂♀ det. PL: Tervuren) = *P. angolensis* n. comb., *U. operosus* Sim. 1896 (♀ Vienna – Paris).

Uloborus planipiedus Sim. 1896 (♀ Vienna) and *U. umbo-niger* Kulcz. 1908 (♀ Warsaw) belong to a deviating group, which may deserve the rank of genus.

Philoponus Thorell 1887, Ann. Mus. Civ. Genova 25, 127: *P. pteropus* Thor. 1887, ibid., 128 from Burma (♂♀ Stockholm – Genoa; Paris). Uloboridae: Uloborinae. Synonymous with *Uloborus*. Senior homonym of *Philoponus* Kohl 1889.

Pholcus Walckenaer 1805, Tabl. Aran., 80: *Aranea phalangoides* Fuesslin 1775, Verzeichn. bek. schweiz. Ins., 61 from Switzerland (no types; ♀ described by WALCKENAER 1805 and ♂ 1837, both sub *P. phalangoides* – no types; coll. PL & Stockholm). Orthography corrected to *phalangoides* by OLIVIER (1789, p. 209), first assigned to Drassides by C. L. KOCH (1837) but listed in Agelenides-Agalenoidae at least by DOLESCHAL (1852), AUSSERER (1867), and CANESTRINI & PAVESI (1868), although it had already been selected as the type genus for the family Pholcidae by C. L. KOCH (1851). Later sometimes also included in Theridiidae (BLACKWALL 1864) or Scytodidae (HERMAN 1878).

Phoneutria Perty 1833, Delect. Anim. artic. Brazil, 196. Originally no generotype was selected, but two species were included in this genus, *P. rufibarbis* and *P. fera* from Brazil (♀♀ – no types, Pl. 39: 2 & 3). SIMON (1897, p. 111) writes »La distribution des divers groupes du genre n'est pas la même; le premier (type *C. rufibarbis* Perty) . . . », and as we know that he really meant generotype when he used such expressions, I regard this procedure as the selection of generotype, although *Phoneutria* was then considered only a group of *Ctenus*. BONNET (1958) listed *P. fera* as the generotype without argumentations. C. L. KOCH (1848) assigned this genus to Lycosidae. KEYSERLING (1881) transferred it to Ctenidae, where it has generally been listed, except sometimes in Clubionidae: Cteninae (e.g., SIMON 1897). The concept of the genus *Phoneutria* has been rather obscure for most arachnologists until the redefinition by BÜCHERL *et al.* (1964), and representatives of *Anahita*, *Cupiennius*, *Ctenus*, and *Viridasius* have been described in it.

No specific revision of this seemingly large genus is presented here. Material of *P. fera* (♂♀ Paris & London), *P. rufibarbis* (♀ London – det. C. L. Koch), and *Ctenus unilineatus* Sim. 1897 (♂♀ London) = *P. unilineata* n. comb. examined.

Phrurolithus C. L. Koch 1839, Die Arachniden 6, 110: *Macaria festiva* C. L. Koch 1835 in HERRICH-SCHÄFFER: Deutschl. Ins. 129 Pl. 15 from Germany (no types; ♂♀ de-

scribed by C. L. KOCH 1839; coll. PL.). Described in Drassides, later listed in Theridides by C. L. KOCH (1850) and OHLERT (1854), and Agelenides (WAGNER 1888), but transferred to Clubionidae: Liocraninae by SIMON (1897). LOHMÄNDER (1944) raised a separate subfamily, Phrurolithinae for it. Transferred here to Gnaphosidae: Micariinae. Synonym *Micariosoma*.

Phryganoporus Simon 1908, Fauna SW-Austr. 1: 12, 267: *Amaurobius gausapatus* Sim. 1906, Ann. Soc. Ent. Belg. 50, 295 from Victoria, Australia (♀ Berlin) = *A. candidus* L. Koch 1872, Arachn. Austr. 1: 1, 333 Pl. 26: 6 from Queensland (♀ Hamburg; non ♂♀ in DONDALE 1966), n. syn. = *P. gausapatus occidentalis* Sim. 1908, loc. cit., from Western Australia (♀ Paris) = *P. candidus* n. comb. Described in Dictynidae (s. lat.), generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Transferred here into Amaurobiidae: Matachiinae.

P. tubicola Sim. 1908 (♂♀ Paris) belongs also here.

Phymatoctenus Simon 1896, Ann. Soc. Ent. France 65, 495: *P. comosus* Sim. 1896, ibid. from Brazil (♀ Paris). Originally assigned into Clubionidae: Cteninae, and listed in Ctenidae: Acantheinae since PETRUNKEVITCH (1928). Listed here in Ctenidae: Acanthoeteninae.

The status of *P. tristani* Reim. 1939 (♀ Vienna – not seen) and *P. sassii* Reim. 1939 (♂ Vienna – not seen) remains obscure, while *P. kollerii* Reim. 1939 (♀ Vienna – not seen) = *Acanthoetenus kollerii* n. comb.

Phyxelida Simon 1894, Ann. Soc. Ent. France 63, 64: *P. makapanensis* Sim. 1894, ibid. f. 1 – 2 from Transvaal (♂♀ Paris). Described in Dictynidae (s. lat.), generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Selected here as the type genus for the new subfamily Phyxelidinae. Synonyms *Amphigyriodes*, *Amphigyrum*, and *Haemilla*, all n. syn., although the two last genera have been synonymized with each other by L. BERLAND (1914).

Amphigyriodes bifoveata Str. 1912 (♀ Berlin) = *P. bifoveata* n. comb., *Amphigyrum nebulosum* Tullg. 1910 (♀ Stockholm; Berlin) = *Haemilla tangensis* Sim. & Fage 1922 (♂♀ Paris), n. syn. = *P. nebulosa* n. comb. & *Tegenaria mirabilis* L. Koch 1875 (♂ London; ♀ Paris) = *P. mirabilis* n. comb. There is also an undescribed species from Turkey (♀ Gothenburg), which may represent a different genus.

Pikelinia Mello-Leitão 1946, An. Ac. Bras. Ci. 18: 1, 47: *Filistata tambilloi* M.-Leit. 1941, Rev. Mus. La Plata, N. S. 2, Zool. 12, 106 from the Argentine (♂ La Plata – not available). Filistatidae.

Pimur Chamberlin 1947, Bull. Univ. Utah 38: 1, Biol. 10: 5, 19: *P. pitus* Chamb. 1947,

ibid., 20 Pl. 4: 32 – 34 from California (♂♀ New York). Described in Amaurobiidae, listed here in Amaurobiidae: Macrobininae, related to *Rubrius*.

A specific revision has been presented by CHAMBERLIN (1947).

Pionaces Simon 1904, Ann. Soc. Ent. Belg. 48, 107: *P. major* Sim. 1904, ibid., 108 f. 6 from Southern Chile (♂ Paris; ♀ undescribed, det. PL.: Paris). Originally assigned to Agelenidae: Cybaeinae, but transferred here to Amaurobiidae, Macrobininae. Synonymized here with *Rubrius* (also ROTH 1967), but *Pionaces* is worthy of subgeneric rank.

Pireneitega Kishida 1955 (? 1928), Acta Arachn. 14: 1, 11 (cf. p. 213): *Amaurobius roscidus* C. L. Koch 1834, Uebers. Arachn. Syst. 1, 15 from Europe (no types) = *Drassus segestri-formis* Dufour 1820, Ann. Gén. Sci. Phys. 6, 297 Pl. 95: 1 from France (♂♀ no types). Described in Agelenidae: Ageleninae, tribus Tegenarini, listed here in Coelotinae. Synonymized here with *Coelotes*. The genotype is even closely related with *C. atropos*, and they belong to the same subgenus by any standards of limitation.

Platoecobius Chamberlin & Ivie 1935, Ann. Ent. Soc. Amer. 28: 2, 266: *Thalamia floridana* Banks 1896, Trans. Amer. Ent. Soc. 23, 58 from Florida (♀ Cambridge). Described in Uroctidae, but generally listed in Oecobiidae, here in subfamily Oecobiinae.

Platyscelum Savigny & Audouin 1825, Explic. Planch. Arachn. Savigny Descr. Egypt. 1: 4, 167: *P. savignyi* Audouin 1825, ibid. from Egypt (no types; ♂♀ described by AUDOUIN 1827) = *Palpimanus gibbulus* (see *Palpimanus*). For familial affiliation, see *Palpimanus*, which is the valid name for this genus.

Plectophanes Bryant 1935, Rec. Canterbury Mus. 4: 2, 82: *P. frontalis* Bryant 1935, ibid. Pl. 11: 10, 12 & 14, 12: 27 from New Zealand (♀ Christchurch – not seen – paratype Cambridge; ♂ described by FORSTER 1964 b). Described in Sicariidae, and selected as the type genus for Agelenidae: Plectophaninae by PETRUNKEVITCH (1939 a). Transferred to Toxopidae by FORSTER (op. cit.). In my opinion, *Plectophanes* belongs to the branch Zodariides, and it may be most closely related to *Zearchaea*, which has previously been listed in Archaeidae.

Numerous additional species of this genus have been described by FORSTER (op. cit.).

Polenecia n. gen., p. 393: *Uloborus productus* Sim. 1873, Mém. Soc. Sci. Liège, 2. Ser. 5, 333 from Corsica (♀ Paris; Stockholm; ♂ described by WIEHLE 1931: type preservation unknown). Uloboridae: Uloborinae. The genotype has

been listed in the Neotropical genus *Sybotas* since SIMON (1892 a).

Polys C. L. Koch 1843, Die Arachniden 10, 97: *P. illepidus* C. L. Koch 1843, *ibid.* f. 821 from Ceylon (no types). Described in the family Mithraidae, but transferred by SIMON (1895 a) to Argiopidae (Araneidae). For numerous synonyms of this genus, see BONNET (1958, p. 3746).

Porrina Simon 1898, Hist. Nat. Araign. 2: 2, 327 f. 332 – 333: *Podophthalma diversa* O. P.-Cambr. 1877, Proc. Zool. Soc. London, 572 Pl. 57: 9 from South America (♀ London). The generotype was described in Podophthalmidae (= Pisauridae), and the genus was assigned to Lycosidae: Hippasinae, in which it has generally been listed, except by MELLO-LEITÃO (1941 a), who placed it in superfamily Lycosaeformia as an intermediate genus between Agelenidae and Lycosidae. Here it is transferred back to Pisauridae. Junior homonym of *Porrina* Grote 1877. I am not sufficiently acquainted with possible synonymies of true Pisaurids, but *Porrina* seems to be at least closely related with *Tetragonophthalma*. If there are no synonymic names for *Porrina*, it must be renamed.

Porteria Simon 1904, Ann. Soc. Ent. Belg. 48, 109: *P. albopunctata* Sim. 1904, *ibid.* f. 7 – 8 from Southern Chile (♂♀ Paris; ♂ Cambridge). Originally assigned to Agelenidae: Cybaeinae, but listed here in Amaurobiidae: Desinae.

Pritha n. gen., p. 300: *Filistata nana* Sim. 1868, Rev. Mag. Zool., 2. Ser. 20, 455 from France (♂♀ Paris; Budapest). Filistatidae.

A specific revision of this seemingly large genus has not been carried out, but the generic affiliation of the following species has been checked:

I. group (*nana*): *F. albimaculata* O. P.-Cambr. 1872 (♀ Oxford – not seen) = *P. albimaculata* n. comb., *F. condita* O. P.-Cambr. 1873 (type preservation unknown; ♂ described by SIMON 1883 a: Paris) = *P. condita* n. comb., *F. vestita* Sim. 1873 (♂♀ Paris) = *P. vestita* n. comb., *F. pallida* Kulcz. 1897 (♂ Warsaw) = *P. pallida* n. comb., and *F. debilis* Sim. 1910 (♂♀ Paris) = *P. debilis* n. comb.

II. group (*garciali*): *F. garciali* Sim. 1892 (♂♀ Paris) = *F. pulchella* (♂♀ Paris), n. syn., The remaining species are known as female specimens only, and their possible synonymies are not discussed here: *F. australiensis* L. Koch 1873 (♀ Hamburg – Paris – Vienna), *F. insularis* Thor. 1881 (♀ ? type Vienna), *F. zebra* Thor. 1895 (♀ London), *F. haselti* Sim. 1906 (♀ Amsterdam), *F. sundai* Kulcz. 1908 (♀ Warsaw – labeled *F. biroii*), *F. littoralis* Roew. 1938 (♀ Brussels), *F. lindbergi* Roew. 1962 (♀ Lund), and *F. poonaensis* Tikad. 1963 (♀ Calcutta). However, all these species are surely representatives of the genus *Pritha*, and most of them are closely related to each other, at least.

III. group (*bakeri*): *F. bakeri* Berl. 1938 (♂♀ Paris) = *P. bakeri* n. comb. There is also an undescribed species from Formosa (♀ Paris).

Prochora Simon 1885, Ann. Soc. Ent. France, 6. Ser. 5, 374: *Agroeca lycosiformis* O.P.-Cambr. 1872, Proc. Zool. Soc. London 1872, 258 Pl. 16: 42 from Israel (♂♀ Oxford – not seen; Paris). Described in Drassidae, transferred into

Clubionidae: Liocraninae by SIMON (1897). Transferred here into Miturgidae: Miturginae. See also *Miturga*.

Prodalia Marx 1891, Proc. Ent. Soc. Washington 2: 1, 7; *P. foxii* Marx 1891, *ibid.*, 35 Pl. 1: 5 from Tennessee (see *Lathys*). Orthography corrected to *foxi* by SIMON (1892 a). Described in Dictynidae, listed here in subfamily Cicu-rininae. Synonymous with *Lathys*.

Prodidomus Hentz 1847, Boston Journ. Nat. Hist. 5, 466: *P. rufus* Hentz 1847, *ibid.*, 467 Pl. 30: 4 from Southern United States (♀ no types; ♂ described by BRYANT 1949 – allotype: Cambridge; neoholotype described by BRYANT 1935 c: ♀ Cambridge). For familial affiliation, see *Miltia*.

Protadia Simon 1898, Hist. Nat. Araign. 1: 1, 239: *Dictyna patula* Sim. 1874, Arachn. France 1, 197 from France (♀ Paris; Helsinki & det. PL: Stockholm) = *D. albopunctata* Menge 1869, Schr. Nat. Ges. Danzig, N. F. 2, 248 Pl. 48: 148 from northern Germany (♂♀ originally Gdansk – destroyed), n. syn. (see *Argenna*). Described in Dictynidae, listed here in subfamily Tricholathysinae. Synonymous with *Argenna*.

Protagroeca Lohmander 1944, Ark. Zool. 35 A: 16, 17 as a subgenus of *Agroeca*: *Agelena proxima* O. P.-Cambr. 1870, Trans. Linn. Soc. Lond. 27: 3, 415 Pl. 54: 13 from England (♂♀ presumably in Oxford; coll. PL). Described in Clubionidae: Liocraninae, listed here in the family Liocranidae, Amaurobioidea.

†*Protochersis* Gourret 1887, Rec. Zool. Suisse 4: 3, 474: *P. spinosus* Gourr. 1887, *ibid.* Pl. 20: 3 from a calcareous swamp in France, Oligocene (Marseilles – not seen). Described in Palpimanidae, listed by BONNET (1958) in Eresidae. It seems to belong to Zadariioidea, but evidently not to Eresidae.

†*Protolachesis* Gourret 1887, Rec. Zool. Suisse 4: 3, 467: *P. annulata* Gourr. 1887, *ibid.* Pl. 21: 17 & 22: 21 – 22 from a calcareous swamp in France, Oligocene (Marseilles – not seen). Described in Enyoidae (= Zadariidae), listed in Eresidae by BONNET (1958). The only specimen described is quite poorly preserved, and there is hardly any proof of its familial affiliation.

Psechrus Thorell 1878, Ann. Mus. Civ. Genova 13, 170: *Tegenaria argentata* Doleschal 1859, Acta Soc. Ind. Neerl. 5, 49 Pl. 8: 9 from Indonesia (♀ no types; ♂ described by THORELL 1881: ♂♀ Stockholm; Berlin & Paris; det. PL: Hamburg). Described in Amaurobiidae, selected as the type genus for the family Psechridae by SIMON (1890). Synonym *Lancaria*.

P. annulatus Kulcz. 1908 (♀ Warsaw; Vienna) = *P. castaneus* Hogg 1914 (♀ London), n. syn., *Tegenaria torva* O. P.-Cambr. 1869 (♂ presumably Oxford; ♀ described by Pocock 1900: London; ♀ Paris) = *P. ghecuanus* Thor. 1897 (subad. ♀

Genoa – Stockholm – Paris – Hamburg), n. syn. = *P. alticeps* Poc. 1899 (subad. ♀ London), n. syn. = ? *P. mimus* Chamb. 1924 (juv. Washington – not seen), n. syn., *P. himalayanus* Sim. 1906 (♂ + subad. ♀ Paris), *P. singaporensis* Thor. 1894 (? part of syntypes: Vienna – Paris) = *P. sinensis* Berl. 1914 (♂ Paris), n. syn., and *P. libellii* Kulcz. 1908 (♀ type preservation unknown) = *P. curvipalpis* Fage 1929 (♂ ♀ Paris), n. syn.

Pseudauximus Simon 1902, Bull. Soc. Ent. France 71, 243: *P. reticulatus* Sim. 1902, ibid. from South Africa (juvv. syntypes Paris – adult specimens probably lost; det. PL ♂ Ter-vuren). Described in Dictynidae, transferred here to Amaurobiidae: Macrobulinae. Senior homonym of *Pseudauximus* Denis 1955.

P. pallidus Purc. 1905 (♂ ♀ Cape Town), and *P. annulatus* Purc. 1908 (♂ Berlin).

Pseudauximus Denis 1955, Arch. Zool. Exp. Gen. 91, 452: *P. libanicus* Denis 1955, ibid. f. 6 from Lebanon (♀ type preservation unknown). Described in Dictynidae, listed here in subfamily Tricholathysinae. Synonymous with *Devade*, n. syn., junior homonym of *Pseudauximus* Simon 1902.

Pseudoceras Kishida 1955 (? 1928) Acta Arachnol. 15: 1, 11: *P. asamensis* Kish. 1955, ibid. from Japan (no types). According to YAGINUMA (in litt.) this reference is the only published information on this species, and as such that short, totally Japanese key for separation of *Pseudoceras* and *Malthonica* is not sufficient. Listed by original reference in Agelenidae: Ageleninae, tribus Malthoniciini, but here the name *Pseudoceras* is merely regarded as a nomen nudum.

Pseudoctenus Caporiacco 1949, Comment. Pontif. Acad. Sci. 13: 6, 448: *P. meneghettii* Capor. 1949, ibid. f. 78 from Kenya (♀ type preservation unknown). Described in Ctenidae: Cteninae, Caloctenini, and listed in subfamily Calocteninae by ROEWER (1954 a). Listed here as Ctenidae incertae sedis.

Pseudophthalmus Joseph 1882, Berl. Ent. Zeitschr. 1882, 19: *P. schmidtii* Joseph 1882, ibid. from Austria (no types). Orthography corrected to *schmidtii* by SIMON (1898 a, p. 351), who also supposed that this genus belongs to Agelenidae: Cybaeinae. However, the description is poor, and the original author refers to affinity with *Trochosa* (Lycosidae). Excluded here from the group treated. Junior homonym of *Pseudophthalmus* Thomson 1878.

Pseudotegenaria Caporiacco 1934, Boll. Mus. Zool. Torino 44, 140: *P. parva* Capor. 1934, ibid. f. 9 from Libya (♀ type preservation unknown). Originally assigned to Agelenidae, and

listed in subfamily Ageleninae by ROEWER (1954 a), here in tribus Tegenarini.

The limitation of *Pseudotegenaria*, *Tegenaria*, and probable new related genera cannot be finally stabilized until a specific revision of this group has been completed. *Tegenaria oribata* Sim. 1916 (♂ ♀ Paris) = *P. oribata* n. comb. is a close relative of the generotype, while the following species probably constitute related groups, which have also been regarded as relatives of *T. oribata* by SIMON (1937).

Group 11 (*armigera*): *T. armigera* Sim. 1873 (♂ ♀ Paris) = *P. armigera* n. comb., *T. herculea* Fage 1931 (♀ Paris) = *P. herculea* n. comb., *T. bayeri* Krat. 1934 (♂ ♀ type preservation unknown – non *T. bayeri* ROEWER 1959: Gothenburg) = *P. bayeri* n. comb., *T. animata* Krat. & Mill. 1940 (♀ type preservation unknown) = *P. animata* n. comb., *T. bosnica* Krat. & Mill. 1940 (♀ type preservation unknown) = *P. bosnica* n. comb., *T. decolorata* Krat. & Mill. 1940 (♀ type preservation unknown) = *P. decolorata* n. comb., and *T. pontica* Charit. 1847 (♀ Moscow – not seen) = *P. pontica* n. comb.

Psilothra Gistel 1848, Nat. Thierr., IX as a *nomen novum* for *Hecaege* Blackwall 1832. Cf. *Hecaege* and *Zora*. For problems of priority between *Psilothra* and *Zora*, see BONNET (1959, p. 4982).

Purumitra n. gen., p. 393: *Uloborus grammicus* Sim. 1893, Ann. Soc. Ent. France 62, 68 from Luzon, the Philippines (♂ Paris). Uloboridae: Uloborinae.

Pycnoctenus L. Koch 1878, Arachn. Austral. 1: 2, 996: *P. robustus* L. Koch 1878, ibid. Pl. 87: 2 from New South Wales, Australia (♀ type preservation unknown; juv. ♀ London). Described in Ctenidae, transferred to Pisauridae: Thalassiae by SIMON (1898 a). Transferred here further to Cycloctenidae. Synonymous with *Cycloctenus*, n. syn.

Rachus Walckenaer 1847, Hist. Nat. Ins. Apt. 4, 459: *Pholcus quadrupunctatus* Lucas 1846, Explor. Sci. Alger., Zool. 1 Arachn., 339 Pl. 15: 2 from Algiers (♀ no types; ♂ described by SIMON 1866 sub *P. sexoculatus*) = *P. senoculata* Dugès 1836, Ann. Sci. Nat., 2. Ser. 6, 160 from the Mediterranean region (no types; ♀ coll. PL). Generally listed in Pholcidae since the creation of this family by C. L. KOCH (1851), except by CANESTRINI (1868) in Agelenides. Synonymous with *Spermophora*.

Radulphius Keyserling 1891, Spinn. Amer. 3 (Brasil. Spinn.), 48: *R. bicolor* Keys. 1891, ibid., P. 1: 22 from Brazil (♀ London). Described in Drassidae, transferred to Clubionidae: Lio-craninae, Miturgae by SIMON (1897). Transferred here into Miturgidae: Eutichurinae.

Raecius Simon 1892, Hist. Nat. Araign. 1: 1, 230: *Amaurobius crassipes* L. Koch 1875, Aegypt. Abyss. Arachn. Jickeli, 32 Pl. 3: 4 from Ethiopia (juv. ♀ London). Described in

Zoropsidae, transferred into Zorocratidae by F. DAHL (1913). Transferred here to Miturgidae: Uliodoninae. Synonym *Mnesitheus*, n. syn.

The synonymies between the species described up to date remain doubtful as the type material of three species consists merely of juvenile specimens. *Mnesitheus asper* Thor. 1899 (♀ Stockholm) = ? *R. aculeatus* Dahl 1901 (juv. ♀ Berlin), n. syn. = *R. asper* n. comb., *M. vittatus* Sim. 1907 (juv. ♀ Paris) = ? *M. zoropsides* Strand 1915 (♂ Vienna), n. syn. Besides, it is not impossible that even *R. asper* might be a synonym of the generotype.

Ranguma n. gen., p. 395: *Miagrammopes similis* Kulcz. 1908, Ann. Mus. Nat. Hungar. 6, 484 Pl. 9: 15, 18, 20 & 29 from New Guinea (♂ Warsaw). Uloboridae: Miagrammopinae.

The following species seem to belong here: *M. rimosus* Sim. 1886 (♀ Paris) = *R. rimosa* n. comb., *M. cambridgei* Thor. 1887 (♀ Genoa; Vienna) = *R. cambridgei* n. comb., *M. albo-maculatus* Thor. 1891 (♀ Genoa; Vienna & Berlin) = *M. biroi* Kulcz. 1908 (♂♂ Warsaw; London & Vienna) = *R. albomaculata* n. comb., *M. orientalis* Bösenb. & Str. 1906 (♂ Frankfurt) = *R. orientalis* n. comb., *M. singaporensis* Kulcz. 1908 (♀ Warsaw) = *R. singaporensis* n. comb., and *M. viridiventris* Str. 1911 (juv. Frankfurt) = *R. viridiventris* n. comb.

Retiro Mello-Leitão 1915, Broteria 13, 131: *R. maculatus* M.-Leit. 1915. *ibid.* from Brazil (♀ type preservation unknown). Some difficulties have arisen concerning the correct name of the large Neotropical genus that is now called *Retiro*. The only description available for the generotype is quite poor, nor has the type material of the other species originally described in *Retiro* been available for me. The latter species seems to be congeneric with the nine species examined, and the same author, MELLO-LEITÃO, has named both species. Besides, the description of the generotype, although insufficient according to the current standards, is not in conflict with characters of the species examined and transferred here to *Retiro*. Described in Dictynidae, transferred here to Macrobulinae: Macrobulinae.

Amaurobius granadensis Keys. 1877 (♀ London) = *R. granadensis* n. comb., *Auximus crinitus* Sim. 1892 (♀ Paris) = *R. crinitus* n. comb., *Auximus plagiatus* Sim. 1892 (juv. ♀ Paris, ♂ described by CAPORICCO 1955: Caracas – not seen), = *R. plagiatus* n. comb., *Auximus fulvipes* Sim. 1906 (♀ Paris) = *R. fulvipes* n. comb., *Auximus procerulus* Sim. 1906 (♂♀ Paris) = *R. procerulus* n. comb., *Auximus rhombifer* Sim. 1906 (♀ Paris) = *R. rhombifer* n. comb., *Auximus lanceolatus* Vell. 1924 (♀ Niteroi – not seen) = *R. lanceolatus* n. comb., *Auximus roberti* Reim. 1939 (♀ Vienna) = *R. roberti* n. comb., *R. nigronotatus* M.-Leit. 1947 (♀ Curitiba – not seen), and *Auximus gratus* Bryant 1948 (♀ Cambridge) = *R. gratus* n. comb. *Auximus quitensis* Sim. 1906 (♀ Paris) is an exceptional species, but in the absence of males I cannot decide yet whether it is worth of a genus of its own or not.

All the species examined are distinctly separate, while the

status of all the remaining species including the generotype is unclear, and at least some of them may be synonymized later.

Rhaeboctesis Simon 1897, Hist. Nat. Araign. 2: 1, 143: *R. equestris* Sim. 1897, *ibid.* from South Africa (♀ Paris). Originally assigned to Clubionidae: Liocraninae. Transferred here to subfamily Anagaphinae that obviously must be included in Gnaphosidae.

Rhion O. Pickard-Cambridge 1870, Proc. Zool. Soc. London, 740: *R. pallidus* O. P.-Cambr. 1870, *ibid.* from Ceylon (♂♀ Oxford). There has been some disagreement concerning the orthography of the generic name and *Rhium* has been used, e.g., by BONNET (1958, pp. 3859 and 3861). Described in Theridiidae, selected as the type genus of Rhioidae by THORELL (1873), but generally included in Dictynidae since SIMON (1892 a). Listed here in subfamily Dictyninae.

Rhoicinaria Exline 1950, Amer. Mus. Novit. 1470, 7: *R. rorerae* Exl. 1950, *ibid.* f. 1 – 5 & 9 – 14 from Ecuador (♂♀ New York; ♀ paratype London). Described in Pisauridae: Rhoicininae. HOMANN (1952, 1961 a) excluded it from this group without proposing a new placing. Transferred here to Amaurobiidae: Altellopsinae.

Cybaeus maculatus Keys. 1877 (♀ London) = *R. maculata* n. comb.

Rhoicinus Simon 1898, Ann. Soc. Ent. France 67, Bull., CXXIX: *R. gaujoni* Sim. 1898, *ibid.* from Ecuador (♀ Paris) as designated by SIMON (1898 a: 322). Described in Lycosidae, selected as the type genus for subfamily Rhoicininae by PETRUNKEVITCH (1923). Transferred to Agelenidae: Rhoicininae by PETRUNKEVITCH (1928), and further to Pisauridae: Rhoicininae by EXLINE (*op. cit.*). ROEWER (1954 a) and HOMANN (1961 a) again included it in Lycosidae, while it is here listed in Amaurobiidae: Rhoicininae.

A specific revision has been presented by EXLINE (1960). Material of *R. wapleri* Sim. 1898 (♀ Paris) *R. rothi* Exl. 1960 (♂♀ New York) and *R. weyrauchi* Exl. 1960 (♀ San Francisco) also examined.

Ritalena Chamberlin & Ivie 1941, Ann. Ent. Soc. Amer. 34, 613: *R. rita* Chamb. & Iv. 1941, *ibid.* Pl. 12: 84 from Arizona (♀ New York – not seen; ♂ will be described by ROTH: New York). Agelenidae: Ageleninae.

Robsonia O. Pickard-Cambridge 1879, Proc. Zool. Soc. London, 686: *Argyroneta marina* Hector 1878, Trans. N. Zeal. Inst. 10, 300 from New Zealand (♀ no types; Oxford; Frankfurt). For the complicated synonymy and homonymy

of this species, see *Dandridgia* and *Desis*. Described in Argyronetidae, generally listed in Agelenidae: Cybaeidae since SIMON (1898 a). Listed here in Amaurobiidae: Desinae. Synonymous with *Desis*.

Roeweriana Kratochvil 1938, as a subgenus of *Hadites*, Práce Morav. Přírod. Spol. 11: 1, 12: *H. bidens* Absol. & Krat. 1932, Acta Mus. Morav. 29, 6 f. 5 from the Dalmatian archipelago, Yugoslavia (♂♀ type preservation unknown). Described in Agelenidae: Ageleninae, listed here in tribus Tegenarini.

Rualena Chamberlin & Ivie 1942, Ann. Ent. Soc. Amer. 35: 2, 232: *R. surana* Chamb. & Iv. 1942, ibid., 234 Pl. 8: 68 from California (♀ New York). Agelenidae: Ageleninae.

CHAMBERLIN & IVIE (1942 a) have presented a specific revision of *Rualena*. Material of an undescribed species (♂♀ Portal) examined.

Rubrius Simon 1887, Miss. Sci. Cap Horn, Zool., E 15: *Coelotes subfasciatus* Sim. 1884, Bull. Soc. Zool. France 9, 123 from Hermite Island, adjacent to Tierra del Fuego (♀ Paris) = *Cybaeus antarcticus* Karsch 1880, Zeitschr. ges. Naturw. 53, 379 Pl. 12: 7 from Patagonia (♂ Berlin; ♂♀ Paris, Berlin; det. PL: Santiago). Originally assigned to Agelenidae: Cybaeinae, transferred here to Amaurobiidae: Macrobulinae. Synonyms *Hicanodon* (cf. this genus), n. syn., *Myntes* and *Pionaces* (also ROTH 1967 a).

A large number of Neotropical and Australian species have been described as representatives of this genus, but most of them belong elsewhere, including all the Australian ones. On the other hand, the limitation of *Rubrius* from really related Macrobuline genera has repeatedly caused trouble. The variation of female genital organs in a single genus is exceptionally large when compared with the standards applied here in general, but all the species included seem to be phylogenetically related.

The following species are here included in *Rubrius*: *Coelotes castaneifrons* Sim. 1884 (♀ Paris; ♂ described by SIMON 1898 a sub *Myntes castaneifrons*: Paris), *Hicanodon cinerea* Tullg. 1901 (♂? type Paris) = *R. cinerea* n. comb., *R. annulatus* F. O. P.-Cambr. 1899 (♀ Berlin) = *R. paganus* Sim. 1902 (♂♀ Paris), n. syn., and *Pionaces major* Sim. 1904 (♂ & subad. ♀ Paris; ♂♀ det. PL: Paris). *R. lineatus* Roth 1967 (♀ San Francisco – not seen; det. PL: Cambridge) and *R. ululus* Roth 1967 (♀ San Francisco – not seen) are closely related to each other and most probably constitute a new genus. *R. scottae* M.-Leit. 1940 (♀ La Plata – not seen) possibly does not belong to *Rubrius*, while *R. enigmaticus* M.-Leit. 1939 (♂ Geneva – not seen) is transferred to Zodariidae (also by ROTH 1967 a). See also *Amphinecta*, *Calacadia*, *Corasoides*, *Gohia*, *Iluara*, *Namandia*, *Oramia*, *Tjurunga*, and *Zorocrates*.

Sabitega Kishida 1955 (? 1928), Acta Arachn.

14: 1, 11 (cf. p. 213): *Aranea ferruginea* Panzer 1804, in SCHÄFFER, Icon. Ins. Ratisb. 3, 227 Pl. 2 from Europe (no types; ♂♀ described by SUNDEVALL 1831 sub *Agelena domestica*; ♂♀ Gothenburg). Described in Agelenidae: Ageleninae, tribus Tegenarini. Synonymized here with *Tegenaria*. Cf. also *Iamatega*.

Sagana Thorell 1875, Tijdschr. Ent. 18, 96: *S. rutilans* Thor. 1875, see *Drapeta*. Described in Drassidae, transferred to Clubionidae: Liocraninae by SIMON (1897). Listed here in family Liocranidae, Amaurobioidea. Synonymous with *Liocranum*.

Saltonia Chamberlin & Ivie 1942, Bull. Univ. Utah 32: 13, Biol. 7: 1, 24: *S. imperialis* Chamb. & Iv. 1942, ibid. Pl. 2: 24 – 25 from California (♂ New York). Described in Agelenidae: Ageleninae, transferred here to Dictynidae: Tricholathysinae.

Saltuinus Simon 1888, Ann. Soc. Ent. France, 6. Ser. 8, 207: *Dolomedes marginellus* C. L. Koch 1848, Die Arachniden 14, 120 f. 1355 from Brazil (♀ no types) ♂ described by KEYSERLING 1877: London; ♂♀ Paris). Originally assigned to Lycosidae. For later familial affiliation see *Thaumasia*, which is the current name of this genus.

Satricum O. Pickard-Cambridge 1892, Biol. Centr. Amer., Aran. 2, 99: *S. gnaphosoides* O. P.-Cambr. 1892, ibid. Pl. 13: 4 – 5 from Central America (♂♀ London) = *Zorocrates fuscus* (see *Zorocrates*). Described in Amaurobiidae. For later placing, see *Zorocrates*, which is a senior synonym. Transferred here to Miturgidae: Tengellinae.

Scotina Menge 1873, Schr. Nat. Ges. Danzig, N.F. 3, 337: *Agelena gracilipes* Bl. 1859, Ann. Mag. Nat. Hist., 3. Ser. 3, 97 from England (♂ Oxford – not seen; ♀ described by O. PICKARD-CAMBRIDGE 1861 sub *Drassus praelongipes*; ♂♀ coll. PL). Described in Drassidae, transferred to Clubionidae: Liocraninae by SIMON (1897). Listed here in Liocranidae.

Material of the two remaining species, *Agroeca celans* Bl. 1841 (♂♀ presumably Oxford; Paris, Turku; ♀ Stockholm) and *Liocranum palliardi* L. Koch 1881 (♂♀ type preservation unknown; coll. PL) examined.

Scotinella Banks 1911, Proc. Ac. Nat. Sci. Philad. 63, 442: *S. pallida* Banks 1911, ibid. Pl. 34: 7 from North Carolina (♀ Cambridge). Described in Clubionidae: Liocraninae, transferred here to Gnaphosidae: Micariinae. Synonymous with *Phrurolithus*.

Scotolathys Simon 1884, Bull. Soc. Zool. France 9, 321: *S. simplex* Sim. 1884 (see *Lathys*). Dictynidae: Cicuriniinae. For different concepts of the definition of this taxon, see *Lathys*, which is its the current name.

See also *Brommella* and *Tugana*.

Scotospilus Simon 1886, Ann. Soc. Ent. Belg. 30, C. R., LXI: *S. bicolor* Sim. 1886, ibid. from Tasmania (♂♀ Paris – ♀). For orthography of the generic name, see BONNET (1958, p. 3975). Described in Agelenidae: Hahniinae, but generally listed in Hahniidae since SIMON (1898 a). Listed here in subfamily Hahniinae.

S. bicolor: Hickm. 1948 (♂♀ Hobart – paratypes coll. Hickman) = *S. hickmani* n. nov., *Hahnia maindroni* Sim. 1906 = *S. maindroni* n. comb., and *H. ampullaria* Hickm. 1948 (♂♀ Hobart – not seen; ♂ coll. Hickman) = *S. ampullaria* n. comb.

Scotussa Simon 1898, Hist. Nat. Araign. 2: 2, 276: *S. zodarioides* Sim. 1898, ibid. f. 278 from South Africa (♀ Paris). Familial affiliation as in the preceding genus. Junior homonym of *Scotussa* Giglio Tos 1894. Cf. also *Scotoussa* (BISHOP & CROSBY 1938). Objective synonym of *Simonida*, synonymous with *Muizenbergia*, n. syn.

Selenops [Dufour] Latreille 1817, in CUVIER: Le Règne animal, 92. The authorship of this genus has caused much confusion (see BONNET 1958, p. 4016, footnote 92). Originally no species was named, but *S. radiatus* Duf. 1819, in LATREILLE: Nouv. Dict. hist. Nat. 30, 579 from the Mediterranean region (no types; ♀ described by AUDOUIN 1827 sub *S. aegyptiaca*, ♂ by WALCKENAER 1837 sub *S. peregrinator*; ♀ Helsinki) is the generotype. First assigned to Thomisidae by C. L. KOCH (1837), and generally listed there until SIMON (1897) selected this genus as the type of the Clubionid subfamily Selenopinae. F. O. PICKARD-CAMBRIDGE (1900) raised it to family rank, but it has always been classified close to Sparassidae, or even as a subfamily of the latter. Listed here in Selenopidae, Lycosoidea. *Hypoplatea* has generally been regarded as a synonym of *Selenops*, but probably it is a genus of its own.

A specific revision of this large genus has not been carried out, and probably the Neotropical and Nearctic species do not belong here.

Material of *S. nesophilus* Chamb. 1924 (♂♀ type preservation unknown; New York) examined as well as unidentified material in several museums.

Seothyra Purcell 1903, Ann. S. Afr. Mus. 3: 1, 31: *S. schreineri* Purc. 1903, ibid. Pl. 1: 5 – 7

from South Africa (♂♀ Cape Town). Eresidae: Eresinae.

Additional species of this genus have been described by PURCELL (1904) and SIMON (1906). Material of *S. semicoccinea* Sim. 1906 (♂ Paris) and *S. fasciata* Purc. 1904 (♀ Cape Town) also examined.

Shango n. gen., p. 359: *Dictyna capicola* Strand 1909, Deutsche Südpol. Exped. 1901 – 1903, 10: 5, Zool. 2, 548 from Capland (♀ Berlin). Dictynidae: Dictyninae.

Sicarius Walckenaer 1847, Hist. Nat. Ins. Apt. 4, 379. This name was published simultaneously with the manuscript name, *Thomisoides*, of NICOLET, and these two names were also originally synonymized with each other. Thus *Thomisoides* must be referred to NICOLET in WALCKENAER (1847), although the description by NICOLET (1849) himself was in fact published two years later. Cf. BONNET (1958, p. 4039). MELLO-LEITÃO (1933) hardly could be regarded as the first reviser in the sense claimed by ICZN (1964: § 24). On the other hand, if the choice of *Sicarius* by WALCKENAER (*loc. cit.*), at the time of original description, could be considered the first revision, this procedure would strictly contradict the fundamental principles of the Code of Ethics (ICZN 1964: A 2). As both these names have been in general use for over a century, the only way to reach stability is the rejection of one of these names, and official validation under Plenary Powers of the other. Personally I prefer *Thomisoides*, as the family name Sicariidae would cause some confusion (cf. KARSCH 1880).

The only species that was originally included in this genus was named *S. thomisoides*, but it was simultaneously synonymized with NICOLET's manuscript name *T. terrosa*. Curiously enough, BONNET (1958, p. 4041 – 4042) prefers the specific name proposed by NICOLET, but WALCKENAER's generic name. As to the specific name, I also prefer *terrosa*, because *S. thomisoides* was later generally regarded a collective species. On the other hand, there is no type material of any of the numerous species of *Thomisoides* described by NICOLET (material of unidentified Chilean species examined: ♀ New York).

The genus *Sicarius* was included by SIMON (1864) in his Clothéiens, corresponding to Uroctidae auct. KEYSERLING (1880) selected it as the type genus of Sicariidae, but it has been listed in Scytodidae (PETRUNKEVITCH 1928), Thomisoididae (MELLO-LEITÃO 1941 a), and Hexophthalmoidae (KARSCH 1880).

Simonida Schiapelli & Gerschman de Pikelin 1958, Rev. Arg. Ci. Nat., Zool. 3: 4, 217 as a nomen novum for *Scotussa* Simon 1898 (see above). Hahniidae: Hahniinae. Synonymous with *Muizenbergia*, n. syn.

Simonus Ritsema 1881, Tijdschr. Ent., 2. Ser. 7, XXVIII as a nomen novum for *Ctenophthalmus* Simon 1880: *C. lineatus* Sim. 1880, Ann. Soc. Ent. Belg. 23, C. R., 174 from West Australia (♀ Paris; juv. ♀ Berlin; ♂ described by SIMON 1909: Paris). Described in Drassidae, transferred to Clubionidae: Cteninae by SIMON (1897 a), and usually listed in Ctenidae: Acan-

theinae since PETRUNKEVITCH (1928). Listed here in Zoridae. Synonym *Ctenomma* (cf. also this genus) and *Ctenophthalmus* Sim. 1880.

Spermophora Hentz 1841, Amer. Journ. Sci. 41, 117: *S. meridionalis* Hentz 1841, *ibid.* Pl. 17: 9 from United States (♀ no types; ♂ described by PETRUNKEVITCH 1910). Although THORELL (1870 a, p. 117) cited the reference of this genus to Agalcnoidae by three authors, the genus *Spermophora*, as defined according to the generotype, has in fact never been included there, but only *Rachus* (cf. that genus). On the other hand, *Spermophora* was first assigned to Pholcoidea by THORELL (1869, p. 101) and later consistently listed in Pholcidae. Synonyms *Oophora* and *Rachus*.

Stegodyphus Simon 1873, Ann. Soc. Ent. France, 5. Ser. 3, 337: *Eresus adspersus* C. L. Koch 1846, Die Arachniden 13, 8 f. 1083 from the Mediterranean region (no types) = *E. lineatus* Latr. 1817, Nouv. Dict. Hist. Nat. 10, 393 from the Mediterranean region (♀ no types; ♂♀ Berlin & Vienna). Described in Eresidae, and generally listed in the subfamily Eresinae.

The specific revision of this genus has not yet been completed, but it is evident that there are numerous synonyms because of the variability of the colouration in this genus. The following notes only are presented here. *Eresus africanus* Bl. 1866 (♀ type preservation unknown; Geneva) = *E. hildebrandti* Karsch 1878 (♀ Berlin), n. syn., but *S. hildebrandti* described by PAVESI (1897), TULLGREN (1910), STRAND (1913 a), and CAPORACCO (1949) refers to *S. mimosarum* Pavese 1883 (♂♀ Genoa; Geneva, London & Berlin). *S. asomptioni* Berl. & Mill. 1940 (♂♀ type preservation unknown) may be only a subspecies of *Eresus dufourii* Aud. (♀ no types; ♂ described by C. L. KOCH 1946 sub *E. semicinctus*; ♀ Vienna & Berlin). For unrevised list of other species, see ROEWER (1954 a, p. 1297 - 1299). Some species are transferred here to the new genus *Magunia*.

Stiphidiellum Dalmás 1917, Ann. Soc. Ent. France 86, 325: *Stiphidion minutissimum* Hogg 1909, Subantarct. Isl. New Zealand, Spid., 157 Pl. 7: 1 from Campbell Islands, adjacent to New Zealand (♀ Dunedin - not seen) = *Lycosa proxima* Urquh. 1885, Trans. N. Zeal. Inst. 18, 201 from New Zealand (♀ Christchurch - not seen), non *L. proxima* C. L. Koch 1848, = *Laestrygones albiceres* Urquh. 1893, *ibid.* 26, 217 from New Zealand (♀ Christchurch - not seen) ♂ described by FORSTER 1955 a: Dunedin - not seen).

Orthography corrected to *albicaris* by BONNET (1957, p. 2340). Synonymized by FORSTER (1955 a), with the genus *Laestrygones* which was originally described in Oxyopidae, but transferred to Perisoblemmidae by BRYANT (1933). Transferred further into Toxopidae by FORSTER (1964 a, 1964 b). In my opinion, this placing is probably not correct, and *Laestrygones* might also belong to the branch Zodariidae.

Stiphidion Simon 1902, Ann. Soc. Ent. France 71, Bull. CCXLII: *S. facetum* Sim. 1902, *ibid.* from Tasmania (♂ Paris - the holotype was described as a juvenile male, but the full-grown palpus is only covered by the integument of the former molt stage) = *Amarara fera* R. Marpl. 1959, Trans. R. Soc. New Zealand 87: 3 - 4, 354 Pl. 3: 8 & 11 from New Zealand

(♂♀ Dunedin - not seen; det. PL: ♂ + subad. ♀ Dunedin), n. syn. Described in Psechridae, and selected as the type genus for subfamily Stiphidiinae by DALMAS (1917). This is here transferred into Amaurobiidae. Synonym *Amarara*, n. syn.

Storena Walckenaer 1805, Tabl. Aran., 83: *S. cyanea* Walck. 1805, *ibid.* Pl. 9: 85 - 86 from Australia (no types - sex unknown). The generotype was mentioned only once more, by WALCKENAER (1837, p. 361) himself, and no material exists. On the other hand, over a hundred additional species from all parts of the world have since been assigned to this genus, and SIMON (1893 a, 1903 a) has synonymized the genera *Aseua*, *Habronestes*, *Selamia*, *Stenosoma*, and *Tenedos* with *Storena*. When modern standards of definition and limitation of spider genera are applied to *Storena* auct., it is necessary first to designate a known species as a new, officially validated generotype, and thereafter revise all the species. I have examined numerous species in several European museums superficially, and I am convinced that they represent several different genera.

Storena was included in Lyeosides by C. L. KOCH (1837) and then in Agelenidae by O. PICKARD-CAMBRIDGE (1869), but SIMON (1873) selected it as the type genus for the subfamily Storeninae in his Enyoidae, and since then it has always been listed in Zodariidae or corresponding groups.

Storkaniella Kratochvil & Miller 1940, Vestn. Ceskosl. Zool. Spolecn. 8, 93: *S. janinensis* Krat. & Mill. 1940, *ibid.* f. 2 & 4 from Greece (juv. ♀ type preservation unknown). Eresidae: Eresinae. Synonym of *Adonea*, n. syn.

Stratinella Denis 1956, Bull. Mus. Nat. Hist. Nat., 2. Ser. 27: 5, 448: *S. spinosa* Denis 1956 (see *Devade*). Dictynidae: Tricholathysinae. Synonymous with *Devade*, n. syn.

Sudesna n. gen., p. 361: *Dictyna hedini* Schenkel 1936, Ark. Zool. 29 A; 1, 14 f. 2 from Kansu, China (♂♀ Stockholm). Dictynidae: Dictyninae.

D. grossa Sim. 1906 (♀ Paris) = *S. grossa* n. comb., *D. grammica* Sim. 1893 (♀ Paris; det. PL: juv. ♀ Berlin) = *S. grammica* n. comb., and *D. anaulax* Sim. 1908 (♂ Berlin) = *S. anaulax* n. comb.

Swainsia B. Marples 1964, Pacif. Sci. 18: 4, 403: *S. armata* B. Marpl. 1964, *ibid.* f. 2 from Swains Island, Polynesia (♂ Honolulu). Described in Agelenidae, transferred here to Dictynidae: Litisedinae.

Sybota Simon 1892, Hist. Nat. Araign. 1: 1, 216: *Sylvia abdominalis* Nic. 1849, in GAY: Hist. Fis. Polit. Chili 10: 3, 466 Pl. 5: 2 from Chile (♀ no types; ♂♀ Santiago). Originally assigned to Uloboridae: Uloborinae, but transferred here to subfamily Hyptiotinae. Synonym *Sylvia* Nicolet 1849.

Uloborus rana M.-Leit. 1941 (♀ La Plata – not available) = *S. rana* n. comb. *Hyptiotes zenzezi* M.-Leit. 1945 (♂ La Plata – not available) = *S. zenzezi*, n. comb. In the original description of this species, the numbers of the figures have been changed: fig. 6 (non 5) corresponds to the verbal description. See also *Polenecia*.

Sylvia Nicolet 1849, in GAY: Hist. Fis. Polit. Chili 10: 3, 466: Originally no generotype was selected, but the five species included were all synonymized with each other by SIMON (1892 a). Thus the generotype is called *S. abdominalis* (cf. *Sybotia*). Objective synonym of *Sybotia*. Junior homonym of *Sylvia* Scopoli 1769 and *Sylvia* Robineau-Desvoidy 1830.

Symphysia Simon 1898, Ann. Soc. Ent. France 67, Bull., XC. Generotype designated by SIMON (1898 a): *S. sylvicola* Sim. 1898, Ann. Soc. Ent. France 67, Bull. XC from Venezuela (♂♀ Paris). Described in Agelenidae, generally listed in Cybaeinae since SIMON (1898 a). Placed here in the superfamily Amaurobioidea as incertae sedis.

S. sexoculata Roth 1967 (♂♀ New York) and *S. dubiosa* Roth 1967 (♀ New York) are certainly congeneric with the generotype. *S. umbrosa* Sim. 1898 (♂♀ Paris) and *S. bifurca* Roth 1967 (♂♀ New York) constitute another pair of related species, but evidently they belong to an undescribed Altelopsine genus.

Syntrechalea F. O. Pickard-Cambridge 1902, Biol. Centr. Amer. 2, Aran., 314: *S. tenuis* F. O. P.-Cambr. 1902, ibid. Pl. 30: 18 from Panama (♀ London – not seen). Described in Pisauridae and later generally listed in Thaumasiinae. Position remains obscure, but evidently a representative of Lycosoidea.

REIMOSER (1939) described another species, *S. porschi* by the male sex.

Syrisca Simon 1885 [1886], Ann. Soc. Ent. France, 6. Ser. 5, 375: *S. pictilis* Sim. 1885, ibid. from Senegal (juv. ♂ Paris). Described in Drassidae, transferred to Clubionidae: Liocraninae by SIMON (1897). Transferred here to Miturgidae: Miturginae.

A specific revision has not yet been completed, but it seems probable that there are both Neotropical and Ethiopian species in this genus. *Drassus insularis* Lucas 1857 (♀ no types; Paris & London) = *S. moesta* Sim. 1896 (♀ Paris), n. syn. Material of *S. vittata* Sim. 1885 (♀ Paris) and *S. longicaudata* Less. 1929 (♂♀ New York) also examined.

Syroris Simon 1908, Fauna SW-Austr. 1: 12, 375: *Aphyctoschaema misella* Sim. 1906, Ann. Soc. Ent. Belg. 50, 298 from New Caledonia (♀ Paris) = *S. seriata* Sim. 1908, Fauna

SW-Austr. 1: 12, 376 from Western Australia (♀ Paris; Berlin), n. syn. Described in Dictynidae (s. lat.), generally listed in Amaurobiidae since PETRUNKEVITCH (1928). Transferred here to Amaurobiidae: Desinae.

See also *Epimecinus*, *Forsteria*, and *Pandava*.

Syspira Simon 1895, Bull. Soc. Zool. France 20, 135: *S. tigrina* Sim. 1895, ibid. from California (♀ Paris). Described in Drassoidae, transferred to Clubionidae: Liocraninae, Miturgae by SIMON (1897). Listed here in Miturgidae, Miturginae.

A specific revision has not yet been carried out. Material of, e.g., *S. synthetica* Chamb. 1924 (♂♀ New York) examined.

Tahuantina n. gen., p. 359: *T. zapfei* n. sp., p. 409 f. 326 from Chile (♂♀ Paris; ♀ Santiago). Dictynidae, Dictyninae.

Taira n. gen., p. 342: *Amaurobius flavidosalis* Yagin. 1964, Misc. Rep. Hiwa Mus. Nat. Hist. 7, 20 f. 1–5 from Japan (♂♀ Osaka II). Amaurobiidae: Amaurobiinae.

It is possible that *Cinielo flavovittata* Grube 1861 (♀ type preservation unknown) also belongs to *Taira*.

Takeoa n. gen., p. 377: *Zoropsis nishimurai* Yagin. 1963, Acta Arachnol. 18: 1, 1 Pl. 1 & 3: 1–12 from Japan (♂♀ Osaka II). Zoridae: Zoropsinae.

Tamgrinia n. gen., p. 340: *Coelotes alveolifer* Schenkel 1936, Ark. Zool. 29 A; 1, 177 f. 59 b from Kansu, China (♂ + subad. ♀ Stockholm) = *Amaurobius potanini* Schenkel 1963, Mém. Mus. Nat. Hist. Nat., N. S., Ser. A 25: 1, 21 f. 4 from Mongolia (♀ Paris). The generotype was transferred from Agelenidae: Ageleninae to Amaurobiidae by SCHENKEL (1963), and the new genus is assigned to the subfamily Amaurobiinae.

Coelotes laticeps Schenkel 1936 (♂ Stockholm, non ♀) = *Amaurobius coelotiformis* Schenkel 1963 (♀ Paris – Basle), n. syn.

Tandil Mello-Leitão 1940, Rev. Mus. La Plata, N. S. 2, Zool., 11: *T. nostalgicus* M.-Leit. 1940, ibid. f. 13 from the Argentine (♀ La Plata – not available). Described in Dictynidae (s. lat.). Listed here as Amaurobioidea incertae sedis, and it may be related to *Symphysia*, although the latter genus has no cribellum and calamistrum.

Tangaroa n. gen., p. 391: *Uloborus tahitiensis* Berl. 1934, Ann. Soc. Ent. France 103, 323 f.

1 – 6 from Tahiti, Polynesia (♂♀ Paris; London). Selected here as the type genus of Uloboridae: Tangaroinae.

U. dissimilis Berl. 1924 (♂ Paris) = *T. dissimilis* n. comb., *U. waitakerensis* Chamberlain 1946 (♀ Auckland – not seen) = *T. waitakerensis* n. comb.

Tapinothele Simon 1898, Hist. Nat. Araign. 2: 2, 313: *T. astula* Sim. 1898, ibid. from Zanzibar (♀ Paris – not seen). Originally assigned to Pisauridae: Dolomedae, and later generally listed in subfamily Thaumasiinae. Listed here in Dolomedidae.

Tapinothelella Strand 1909, Deutsche Süd-polarexp. 1901 – 03 10: 5, Zool. 2, 586: *T. laboriosa* Str. 1909, ibid. from South Africa (juv. ♀ Berlin – not seen). Originally assigned to Pisauridae, and listed in Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae, probably only a synonym of *Tapinothele*.

Tapinothelops Roewer 1954, Explor. Parc Nat. Upemba 30, 393: *Tapinothele concolor* Caporiacco 1947, Ann. Hist. Nat. Mus. Hungar. 40: 3, 117 from Arusha, East Africa (♀ Budapest – not seen). Originally assigned to Pisauridae: Thaumasiinae. Transferred here outside the groups treated, may belong to Zodarioidea.

Tarapaca n. gen., p. 304: *Oecobius nieborowski* Kulcz. 1909 (♀ Warsaw; ♂ described by BANKS 1930; det. PL: ♂♀ Hamburg) = *O. benneri* Petr. 1929 (♀ New York), n. syn. = *O. vokesi* Gertsch & Davis 1942 (♀ New York), n. syn. = *O. audanti* Bryant 1948 (♂♀ Cambridge – not seen), n. syn. The synonymy of the two latter species with *O. benneri* has been stated by SHEAR (in litt.)

O. beatus Gertsch & Davis 1937 (♂♀ New York) = *T. beata* n. comb. According to SHEAR (in litt.), there are numerous undescribed relatives of these species in the Nearctic and the Neotropical regions.

Taurongia Hogg 1901, Proc. Zool. Soc. London, 279 as a nomen novum for *Hylobius* Hogg 1900: *H. divergens* Hogg 1900, Proc. Soc. Victoria, N. S. 13: 1, 82 Pl. 13: 2 from Victoria, Australia (♀ London) = *H. punctatus* Hogg. 1900, ibid., 84 Pl. 13: 3 from Victoria, Australia (♂ + juv. ♀ London), n. syn. Described in Amaurobiidae, transferred here to Amaurobiidae: Desinae. Objective synonym with *Hylobihoggia* and *Hylobius* Hogg 1900.

There are two undescribed species from South Australia and Tasmania (♀♀ London).

Tegenaria Latreille 1804, N. Dict. Hist. Nat. 24, 134. Originally no generotype was selected, and until recently the synonymic history of the most common species has been a chaotic

one. For details, see BONNET (1954; 1959, p. 4276 – 4284). According to him the generotype is *Araneus domesticus* Cl. 1757, Aran. Svec., 76 Pl. 2 & 9: 2 from Sweden (♂ in part – no types; ♀ described by AUDOUIN 1827; coll. PL & numerous museums). Generally listed in Agelenidae since C. L. KOCH (1837), but in Dras-soidea by THORELL (1858). Synonyms *Arachne*, *Aranea* Latreille 1806, *Drymonia* Simon 1875, *Iamatega*, *Philoeca*, and *Sabitega*.

Numerous species from all main regions have been described as representatives of *Tegenaria*, but it is evident that this genus is only Palearctic in natural distribution. However, the generotype and some other species have been spread all over the world with the aid of man.

Tegenaria is one of the largest genera of the superfamily Amaurobioidea, but no attempt is made here to present a detailed specific revision. However, the generic affiliation of the following species has been checked:

Group I (*domestica*): *T. pagana* C. L. Koch 1841 (♂♂ no types; Berlin, Gothenburg & Paris) and *T. racovitzae* Sim. 1907 (♂ Paris).

Group II (*agrestis*): *Aranea agrestis* Walck. 1802 (♂♀ no types; Paris), *T. corsica* Bremi-Wolff 1849 (no types; ♂ described by SIMON 1875 sub *T. pallidula*, ♀ sub *T. ericarium*: Paris).

Group III (*ferruginea* = *Iamatega* and *Sabitega*): *Aranea ferruginea* Panzer 1804 (no types; ♂♀ described by SUNDEVALL 1831s sub *Agelena domestica*; ♂♀ Gothenburg, Berlin & Paris), *Aranea parietina* Fourcroy 1785 (no types; ♀ described by AUDOUIN 1827 sub *T. domestica*, ♂ by C. L. KOCH 1841 sub *T. intricata*; ♂♀ Gothenburg & Berlin), *T. silvestris* L. Koch 1872 (♂♀ type preservation unknown; coll. PL & Gothenburg), *T. campestris* C. L. Koch 1834 (no types; ♂♀ described by C. L. KOCH 1841; Berlin), *T. soriculata* Sim. 1873 (♂♀ Paris), *T. annulata* Kulcz. 1912 (♀ type preservation unknown; ♂ described by KRATOCHVIL & MILLER 1940; Paris), *T. antrorum* Sim. 1916 (♀ Paris), *T. ligurica* Sim. 1916 (♂♀ Paris), *T. hispanica* Fage 1931 (♀ Paris).

The following species must be transferred to this group, although their synonymy is obscure: *Textrix lusitanica* Kulcz. 1911 (♂♀ type preservation unknown) = *Tegenaria lusitanica* n. comb. = secondary homonym of *T. l.* Schenkel 1938, *Coelotes stylifer* Capor. 1934 (♂♀ type preservation unknown) = *T. stylifera* n. comb., and *Tetrilus strandi* Capor. 1936 (♂ type preservation unknown) = *Tegenaria strandi* n. comb.

Group IV (*bucculenta*): *Coelotes bucculentus* L. Koch 1868 (♀♂ type – Berlin) = *T. cisticola* Sim. 1870 (♂♀ Paris), n. syn. and *T. feminea* Sim. 1870 (♂ Paris).

Group V (*atrica*): *T. atrica* C. L. Koch 1843 (♂♀ no types; Berlin; ♀ coll. PL) and *T. saeva* Bl. 1844 (♂♀ type preservation unknown; Paris).

See also *Calymmaria*, *Cambridgea*, *Cicurina*, *Coelotes*, *Coras*, *Cryphoea*, *Dictyna*, *Emblyna*, *Eocryphoea*, *Fecenia*, *Haemilla*, *Kidugua*, *Histopona*, *Hygropoda*, *Liocranum*, *Matachia*, *Miturga*, *Phyxelida*, *Psechrus*, *Pseudotegenaria*, *Syrisca*, *Textrix*, *Uliodon*, and *Urquhartia*.

Teippus Chamberlin 1924, Proc. U. S. Nat. Mus. 63: 13, 28: *T. lamprus* Chamb. 1924, ibid.

from Southern North America (juv. probably in Washington) = *Micrommata pinicola* Hentz 1850, Boston Journ. Nat. Hist. Soc. 6, 287 Pl. 10: 14 from Southern North America (♀ no types; ♂ described by BISHOP & CROSBY 1936 sub *Dolomedes pinicola*). Originally assigned to Pisauridae and listed in subfamily Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae.

A specific revision has not been carried out.

Temecula O. Pickard-Cambridge 1896, Biol. Centr. Amer., Aran. 1, 170: *T. mexicana* O. P.-Cambr., *ibid.* Pl. 22: 8 from Mexico (♂♀ London). For synonyms of the generotype, see *Goeldia*. Described in Dictynidae, transferred to Amaurobiidae by CHAMBERLIN & GERTSCH (1958). Transferred here to Titanocidae. Synonymous with *Goeldia*, n. syn.

Teminius Keyserling 1887, Verh. Zool. Bot. Ges. Wien 37, 422: *T. insularis* Keys. 1887, *ibid.* Pl. 6: 1 from Haiti (♀ type preservation unknown; ♂ described by PETRUNKEVITCH 1925 sub *Syrisca hirsuta*). According to the current rules of homonymy, this species must be called *T. keyserlingi* (Sim.) 1897, because SIMON (1897) synonymized *Teminius* erroneously with *Syrisca*, where the name *insularis* was preoccupied by *Drassus insularis* Lucas 1857. Originally assigned to Drassidae s. lat., transferred to Cluibionidae: Liocraninae by SIMON (1897), and listed there also by PETRUNKEVITCH (1928) and BONNET (1959), although BRYANT (1940) transferred *Teminius* back to Gnaphosidae, and ROEWER (1954 a) listed it in Gnaphosidae: Drassodinae.

Tengella F. Dahl 1901, Sitz.-Ber. Ges. naturf. Fr. Berlin 1901: 9, 251: *T. perfuga* Dahl 1901, *ibid.* from South America (♀ Berlin) = *Metafencenia radiata* Kulcz. 1909, Bull. Acad. Sci. Cracov., 447 Pl. 22: 18 from Costa Rica (♀ type preservation unknown; juv. ♀ Vienna – det. REIMOSER). Described in Zoropsidae, but later selected as the type genus for the family Tengellidae by F. DAHL (1908). Listed here in Miturgidae: Tengellinae. Synonym *Metafencenia*, n. syn.

Metafencenia albolineata F. O. P.-Cambr. 1902 (♂ + juv. ♀ London) = *T. albolineata* n. comb.

Tephlea Simon 1878, Arachn. France 4, 207: *T. agelenoides* Sim. 1878, *ibid.* from Syria (♀ Paris). For the synonymy of the generotype and the familial affiliation, see *Cithaeron*, which is the current name of this genus.

Teratodes C. L. Koch 1839, Die Arachniden 5, 6: *T. attalicus* C. L. Koch 1839, *ibid.* from the Mediterranean region (♀ no types). For synonyms, see *Filistata*, which is the senior synonym of this genus. Described in Drassidae, and later listed in Mygalides by KOCH himself

(C. L. KOCH 1851), but always listed in Filistatidae, since AUSSERER (1867). Junior homonym of *Teratodes* Brullé 1835, senior homonym of *Teratodes* Guenée 1845.

Tetrilus Simon 1886, Ann. Soc. Ent. Belg. 30, C. R., LX: *T. japonicus* Sim. 1886, *ibid.* from Japan (♀ Paris) = *Moguracicurina honesta* Komatsu 1947 (♂♀ type preservation unknown), n. syn. Originally assigned to Ageleninae, and generally listed in subfamily Ageleninae since SIMON (1898 a). Transferred here to Dictynidae: Cicurinae, synonymous with *Cicurina*, n. syn., senior synonym of subgenera *Cicurella* and *Moguracicurina*, both n. syn.

Since the original description and generotype designation this generic name has been mainly used for the well-known European species that are here assigned to the Hahnid genus *Tuberta*, while the generotype has been mentioned only in catalogues. See also *Gilltagia*, *Paratetrilus*, and *Tegenaria*.

Textrix Sundevall 1833, Consp. Arachn., 19: *Agelena lycosina* Sundev. 1831, K. Vet. Akad. Handl., 130 from Sweden (♂♀ no types; ♂♀ coll. PL) = *Aranea fuliginea* Martini & Goeze 1778, D. Martin Listers Naturgeschichte der Spinnen überhaupt und der Engelländischen Spinnen insonderheit aus dem Lateinischen übersetzt, und mit Anmerkungen vermehrt, 156 (as a nomen novum for a prior descriptive name by LISTER 1671) = *Aranea eruciger* Martini & Goeze 1778, *ibid.*, 288 (as a nomen novum for a prior descriptive name by SCHAEFFER 1767) = *Aranea denticulata* Oliv. 1789, Encycl. méth. 4, 213 from Southern Europe (no types). By strict application of the present rules of nomenclature, the generotype should be called *Textrix fuliginea* (Mart. & Goeze) 1778. In contrast to the case of *Eresus sandaliatus*, the valid name of the generotype of *Textrix* is not unknown to later authors (cf. H. LUCAS 1844 and THORELL 1871). Thus it is a matter of opinion, whether *denticulata*, by far the most common name, should be officially validated or not.

This genus has been listed in Agelenidae since the creation of this family, but by THORELL (1858) in Drassidae and by HOMANN (1961 a) in Hersiliidae: Textricinae. KISHIDA (1955) listed it in Agelenidae: Textrichinae, while all other authors have left it in the nominate subfamily, Ageleninae. In my opinion, tribus is the most convenient taxon for the group *Textrix*, *Lycosoides*, and *Maimuna*, which comprise the con-

cept of *Textrix* by all the modern authors. Senior homonym of *Textrix* Roemer 1857.

The specific revision of *Textricini* has not yet been completed, but the following species, at least seem to belong here: *T. caudata* L. Koch 1872 (♂♀ type preservation unknown), *T. albosignata* Sim. 1875 (♀ type preservation unknown; ♂ described by CHYZER & KULCZYNSKI 1897), and *T. pinicola* Sim. 1875 (♂ type preservation unknown). See also *Histopona*, *Lycosoides*, *Maimuna*, and *Tegenaria*.

Thaïda Karsch 1880, Zeitschr. ges. Naturw. 53, 389: *T. peculiaris* Karsch 1880, *ibid.* Pl. 12: 14 from South America, presumably Chile (♂ originally Berlin – lost; det. PL: ♀ Berlin & Hamburg) = *Austrochilus manni* Gertsch & Zapfe 1955, Trab. Lab. Zool. Univ. Chile 2, 47 from Chile (♂♀ New York; juv. ♀ Santiago). Described in Agelenidae, and classified there as incertae sedis by SIMON (1898 a), but since PETRUNKEVITCH (1928) generally listed in Cybaeinae. Selected here as the type genus for the family Thaididae. Synonym *Austrochilus*, n. syn.

Thalamia Hentz 1850, Boston Journ. Nat. Hist. Soc. 6, 35: *T. parietalis* Hentz 1850, *ibid.* Pl. 4: 16 from Alabama (♀ type preservation unknown) = *Oecobius annulipes* (see *Omanus*). For familial affiliation, cf. *Oecobius*. Synonyms *Omanus* and *Tiroecobius*.

Oecobius similis Kulcz. 1909 (♂♂ presumably Funchal – Warsaw, ♀ Warsaw examined) = *T. similis* n. comb., *O. minor* Kulcz. 1909 (♂♀ presumably Funchal) = *T. minor* n. comb., and *O. kahmanni* Kritscher 1966 (♂ Frankfurt – not seen) = *T. kahmanni* n. comb. See also *Oecobius* and *Platoecobius*.

Thalassioptis Roewer 1954, Explor. Parc Nat. Upemba 30, 354: *T. vachoni* Roew. 1954, *ibid.* f. 99 & 150 from Madagascar (♂ type preservation unknown). In 'Katalog der Araneae' which was printed before the publication of the description of this genus, both generic and specific names of this species were unsimilar: *Thalassioptis fagei* (ROEWER 1954 a, p. 146). Originally assigned to Pisauridae: Thalassinae, transferred here into Ctenidae: Thalassinae.

Thalassius Simon 1885, Bull. Soc. Zool. France 10, 13 as a nomen novum for *Titurius* Simon 1884: *Titurius marginellus* Sim. 1884, Ann. Mus. Civ. Genova 20, 329 from Burma (type preservation unknown; juv. ♂ Paris) = *Dolomedes albocinctus* Doleschal 1859, Act. Soc. Ind. Neerl. 5, 9 Pl. 15: 4 from Indonesia (♀ type preservation unknown). Described in Lycosidae, listed in Pisauridae: Thalassinae by SIMON (1897), and selected by PETRUNKEVITCH (1928) as the type genus for subfamily Thalassinae. Listed

here in Ctenidae: Thalassinae. Synonyms *Dolopoeus* and *Titurius* Simon 1884.

Numerous Ethiopian species of this genus have been described by different authors, and revised by ROEWER (1954 b). In my opinion, most of them must be synonymized with each other, but a final revision is omitted here. The only Oriental species apart from the generotype, *Dolopoeus cinctus* Thor. 1891, may also be synonymous with *T. albocinctus*. Material of numerous identified and unidentified Ethiopian species examined in Berlin, Paris and London.

Thallumetus Simon 1892, Ann. Soc. Ent. France 61, 434: *T. salax* Sim. 1892, *ibid.* Pl. 9: 7 from Venezuela (♂ Paris ? – not seen). Dictynidae: Dictyninae. Synonym *Dixomys*.

The specific revision of this genus has not yet been completed, and there are several samples of unidentified material in Paris. Following notes only may be given here: *T. acanthochirus* Sim. 1904 (♂ Paris; ♂♀ det. PL: Santiago) = *T. caelatus* Sim. 1904 (♀ Paris), n. syn., *Dictyna latifemur* Soares & Camargo 1948 (♂♀ presumably in São Paulo I) = *T. latifemur* n. comb. *T. dulcineus* Gertsch 1946 (♀ New York – not seen) is evidently not a representative of this genus (cf. GERTSCH 1946 a). For other species listed in this genus up till now, see ROEWER (1954 a, p. 1334).

Thasyraea L. Koch 1878, Arachn. Austral. 1: 2, 982: Originally two species were included, and SIMON (1897) selected *T. ornata* L. Koch 1878, *ibid.*, 983, Pl. 86: 1 from Queensland, Australia (juv. ♀ type preservation unknown) as the generotype. Originally assigned to Lycosidae, but transferred to Clubionidae: Ctenidae by SIMON (1897). Listed in Ctenidae: Calocteninae since PETRUNKEVITCH (1928). Transferred here to Zoridae, closely related to *Simonus*.

T. lepida L. Koch 1878 (♀ type preservation unknown) is closely related to or synonymous with the generotype.

Thaumasia Perty 1833, Delect. Anim., 192: *T. senilis* Perty 1833, *ibid.*, Pl. 38: 5 from Brazil (♂ no types). There is no material of the generotype in any museum, and probably some of the species described later are in fact synonymous with *T. senilis*. SIMON (1898 a) listed this genus in Pisauridae: Dolomedae, and PETRUNKEVITCH (1928) selected it as the type genus for Pisaurid subfamily Thaumasiinae. Listed here in Dolomedidae. Synonym *Saltuinus*. Senior homonym of *Thaumasia* Albers 1850 and *Thaumasia* Westlund 1902.

No specific revision of this seemingly large genus has been carried out. Material of *Dolomedes marginella* C. L. Koch 1848 (♀ no types; ♂ described by KEYSERLING 1877: London; Paris), *Saltuinus scoparia* Sim. 1888 (♂ Paris), *T. velox* Simon 1898 (♂ Paris), and *T. uncata* F. O. P.-Cambr. 1901 (♂♀ London) examined.

Themacrys Simon 1906, Ann. Soc. Ent. Belg. 50, 287: *T. irrorata* Sim. 1906, *ibid.* 288 from

Natal (♀ Paris) = *Haemilla australis* Lawr. 1937, Ann. Natal Mus. 8, 217 f. 2 from Zululand (♂♀ Pietermaritzburg), n. syn. Described in Psechridae, but listed in Tengellidae: Tengellinae since PETRUNKEVITCH (1928). Transferred here to Amaurobiidae: Phyxelidinae.

Haemilla cavernicola Lawr. 1939 (♂♀ Pietermaritzburg) = *T. cavernicola* n. comb., *H. monticola* Lawr. 1939 (♂ Pietermaritzburg) = *T. monticola* n. comb., and *H. silvicola* Lawr. 1938 (♂ Pietermaritzburg; ♀ described by LAWRENCE 1939 Pietermaritzburg: specimen labeled as type belongs to another species of *Themacrys*; ♂♀ Tervuren) = *T. silvicola* n. comb. See also *Xevioso*.

Thomisoides Nicolet 1847, in WALCKENAER: Hist. Nat. Ins. Apt. 4, 379. For the complicated synonymy of this genus and *Sicarius* see the latter genus.

Thoriosia Simon 1910, Ann. Mus. Civ. Genova 44, 360: *T. fulvastra* Sim. 1910, ibid. from São Thomé, West Africa (♀ type preservation unknown). Described in Clubionidae: Cteninae, and listed in Ctenidae: Cteninae since PETRUNKEVITCH (1928). Position unknown to me.

There are three species altogether.

† *Thyelia* Koch & Berendt 1854, in BERENDT: Die im Bernstein befindlichen organischen Reste der Vorwelt 1: 2, 50: *T. tristis* Koch & Ber. 1854, ibid., 51 Pl. 5: 38 from Baltic amber, Oligocene (types probably lost). Described in Agelenidae, later listed in Theridiidae by BONNET (1959, p. 4599). Senior homonym of *Thyelia* Walker 1865. *Thyelia* Berendt 1845 is a nomen nudum.

Thysanina Simon 1910, Denkschr. Med. Nat. Ges. Jena 16, 201: *T. serica* Simon 1910, ibid. from Southwest Africa (?? paratype Paris). Described in Clubionidae: Lioeraninae, transferred here to Clubionidae s. str.

Tikaderia n. gen., p. 346: *Malthonica psechrina* Sim. 1906, Ann. Soc. Ent. France 75, 313 from Himalaya (♀ Paris). Agelenidae: Ageleninae, tribus Agelenini.

Tinus F. O. Pickard-Cambridge 1901, Biol. Centr. Amer. 2, Aran., 310: *T. nigrinus* F. O. P.-Cambr. 1901, ibid. Pl. 30: 8–9 from Costa Rica (♂♀ London). Described in Lycosidae, transferred to Pisauridae: Dolomedae by SIMON (1903 a), and listed in subfamily Thaumasiinae since PETRUNKEVITCH (1928). Listed here in Dolomedidae.

Material of *T. tibialis* F. O. P.-Cambr. 1901 (♂ London) also examined.

Tiroecobius Kishida 1947, Dobutsu Zukan, 997 (not seen!): *T. nipponicus* Kish. 1947, ibid. from Japan (type preservation unknown) = *Oecobius annulipes* Luc. 1846 (see *Thalamia*). Described in Oecobiidae, and synonymized with

Oecobius by YAGINUMA (1962 a). Synonymous with *Thalamia* (cf. this genus).

Titanoeca Thorell 1870, N. Acta Reg. Soc. Sci. Upsal., 3. Ser. 7, 124: *Theridion IV-guttatum* Hahn 1831, Die Arachniden 1, 89 f. 63–64 from Central Europe (♂♀ no types; Helsinki, Paris, Stockholm, Warsaw, Basle, Geneva, Budapest, Vienna & coll. PL). The same paper (HAHN 1831, p. 82 f. 62) also includes a description of *Theridion obscurum*, referring to *Aranea obscura* Walck. 1802, Faun. Paris. 2, 209 from France (♂♀ no types). These two species were synonymized by THORELL (1870 a). This paper also includes the synonymization of *Amaurobius kochi* Auss. 1867, Verh. Zool. Bot. Ges. Wien 17, 162 Pl. 7: 5 from the Tyrol, Austria (♂ types lost) with the generotype of *Titanoeca*, although this procedure has either been neglected or not accepted by all subsequent authors. TULLGREN (1942) first mentioned the generotype from Northern Europe by the name *Titanoeca tristis* (non L. Koch 1872). The corresponding material was examined by myself in Stockholm (LEHTINEN 1964). The complicated homonymy of the generotype under the specific name *obscura* is tabulated on p. 236 (*Goeldia*), but there is also a secondary homonymy in connection with the combination *Theridion notatum*: *Aranea notata* L. 1758 was used in this combination by WIEHLE (1937), while the generotype of *Titanoeca* was originally described in this combination by WALCKENAER (1841). The orthography of the generotype was corrected to *quadriguttata* by original description of the genus (THORELL 1870 a). Described in Agelenoidae: Amaurobiinae, and alternatively listed in Dictynidae (s. lat.) (e.g., SIMON 1892 a) or Amaurobiidae (e.g. ROEWER 1954 a). Selected as the type genus for the family Titanoecidae by myself (LEHTINEN *op. cit.*)

The geographic variation of the species of this genus has been extensively studied by myself, but the detailed results will be published later. Evidently there are fairly well defined subspecies in the wide-spread species *quadriguttata* and *flavicomis*, at least. Cf. also the results obtained by HOLM (1950) and CHAMBERLIN (1947). HUBERT (1966) has recently worked out detailed figures of the internal female genitalia of the European species.

Group I (*quadriguttata*): *T. schineri* L. Koch 1872 (♂♀ type preservation unknown; Berlin, Helsinki, Warsaw, Brno & Budapest), *T. flavicomis* L. Koch 1872 (♂♀ type preservation unknown; det. Simon: Paris) = *Amaurobius simplex* O. P.-Cambr. 1872 (juv. ♂ Oxford), n. syn. = *A. ruficeps* O. P.-Cambr. 1872 (♂ Oxford), n. syn. = *T. nivalis* Sim. 1874 (♂♀ Paris; Basle, Uppsala, Helsinki & coll. PL), n. syn. = *T. sibirica* L. Koch 1879 (♀ + juv. ♂ Stockholm–Paris–

Vienna), n. syn. = *T. americana* Emert. 1888 (♂♀ New York), n. syn. = *A. nigrellus* Chamb. 1920 (♀ Cambridge - cf. CHAMBERLIN 1947), n. syn. = *T. intermedia* Capor. 1934 (♂♀ type preservation unknown - paratypes Florence), n. syn. = *T. silvicola* Chamb. & Iv. 1947 (♂♀ New York - cf. HOLM 1950), n. syn. The exact date of the papers by L. KOCH (1872) and O. PICKARD-CAMBRIDGE (1872) remains unknown to me, but at least the name *A. simplex* becomes unavailable, because it might be regarded as a junior secondary homonym of *Coelotes simplex* O. P.-Cambr. 1885 as the species of *Coelotes* have been repeatedly listed by the generic name *Amaurobius*. In fact, the combination *A. simplex* (O. P.-Cambr.) 1885 has probably never before been printed.

T. brunnea Emert. 1888 and *T. americana anopla* Chamb. 1947 (♀ New York) = *T. anopla* n. stat.

Group II (*monticola*): *Dictyna monticola* Sim. 1870 (♂ Paris; ♀ described by SIMON 1874 sub *T. monticola*: Paris), *D. praefixa* Sim. 1870 (♂♀ Paris). This species has been referred to as *T. praefixa* since SIMON (1874), but this is an invalid correction, because the original orthography *praefixa* also refers to a Latin word.

T. tristis L. Koch 1872 (♂♀ type preservation unknown; Paris) = *T. veteranica* Herman 1879 (♂♀ Budapest; Vienna), n. syn. The valid name *T. tristis* is a double secondary homonym: *Latrodectus tristis* Can. & Pav. 1870 was synonymized with some doubts with *T. tristis* L. Koch 1872 and simultaneously considered a nomen nudum by SIMON (1874), and *Amaurobius tristis* L. Koch 1875 (♀ type preservation unknown - from Ethiopia) was erroneously synonymized with *T. tristis* L. Koch 1872 by ROEWER (1954 a). *A. tristis* L. Koch 1875 really seems to be a true *Titanoeca* but no new name is here proposed, as its status remains obscure. The fossil species assigned to *Titanoeca* by SCUDDER (1890) evidently belong elsewhere, and they were listed in the Gnaphosid genus *Palaeodassus* by PETRUNKEVITCH (1922). See also *Anuwinda*, *Auximus*, *Goeldia*, *Nurscia*, and *Pandava*.

Titiotus Simon 1897, Hist. Nat. Araign. 2: 1, 113: *T. californicus* Sim. 1897, ibid. f. 97 from California (♀ Paris). Originally assigned to Clubionidae: Cteninae, Ctenaeae. Transferred here to Mirturgidae: Tengellinae. Synonym *Anachemmis*.

The status of *T. brasiliensis* M.-Leit. 1915 (♀ type preservation unknown) is quite obscure. *Liocranoides flavescens* Chamb. & Iv. 1941 (♀ + undescribed ♂ New York) = *T. flavescens* n. comb.

Titurius Simon 1884, Ann. Mus. Civ. Genova 20, 329: *T. marginellus* Sim. 1884 (see *Thalassius*). Objective synonym of *Thalassius*, junior homonym of *Titurius* Pascoe 1875.

Tivyna Chamberlin 1948, Bull. Univ. Utah. 38: 15, Biol. 10: 6, 16: *Dictyna floridana* Banks 1904, Proc. Acad. Nat. Sci. Philadelphia 56, 125 Pl. 7: 10 from Florida (♂♀ Cambridge) = *D. pallida* Keys. 1887, Verh. Zool. Bot. Ges. Wien 37, 472 Pl. 2: 33 from Maryland (♀ Washington - not seen; paratype ♀ London). Dictynidae: Dictyninae.

A specific revision of *Tivyna* has been presented by

CHAMBERLIN & GERTSCH (1958, pp. 51 - 53) as the *spathula* group of *Dictyna*.

Tjurunga n. gen., p. 331: *Rubrius paroculus* Sim. 1903, Ann. Soc. Ent. Belg. 47, 35 from Tasmania (♀ Paris). Amaurobiidae: Stiphidiinae.

Tortolena Chamberlin & Ivie 1941, Ann. Ent. Soc. Amer. 34, 614: *Agelena confusa* Gertsch & Ivie 1936, Amer. Mus. Novit. 858, 25 f. 53 - 54 from Costa Rica (♂ New York). Agelenidae: Ageleninae.

A specific revision has been published by CHAMBERLIN & IVIE (1941). Material of *Tortolena* sp. (♂♀ New York) examined.

Tosyna Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 16: *Dictyna apachea* Chamb. & Iv. 1935, ibid. 26: 4, Biol. 2: 8, 28 Pl. 12: 95 - 96 from Arizona (♂♀ New York; Paris). Dictynidae: Dictyninae. Synonymous with *Dictyna*. See also *Emblyna*.

Toxops Hickman 1940, Proc. R. Soc. Tasmania 1939, 126: *T. montanus* Hickm. 1940, ibid. Pl. 1 - 6 from Tasmania (♂♀ Hobart - paratypes coll. V. Hickman). Selected as the type genus for Toxopidae by original description.

Toxopsiella Forster 1964, Ann. Natal Mus. 16, 114: *T. lawrencei* Forster 1964, ibid., 115 f. 1 - 4 from New Zealand (♂♀ Dunedin - not seen). Originally assigned to Toxopidae, transferred here to Cycloctenidae.

A specific revision has been presented in connection with the original description, but it is possible that some of the species in fact belong to *Anoteropsis* and *Galliena*, or even to some other genera of Lycosoidea.

Trechalea Thorell 1869, N. Acta Reg. Sci. Upsal., 3. Ser. 7: 1, 37 as a nomen novum for *Triclaria* C. L. Koch 1848 (see this genus). Originally no species were listed, and no reference to the position of this genus was presented. SIMON (1890) selected it as the type genus of the family Trechaleidae, but included it later in Pisauridae: Dolomedae (SIMON 1898 a). Listed here as Lycosoidea incertae sedis; probably related to Zoridae, especially *Neoctenus*.

Material of *T. amazonica* F. O. P.-Cambr. 1903 (♂♀ London) examined. No specific revision of this large genus has been carried out.

Tricholathys Chamberlin & Ivie 1935, Bull. Univ. Utah. 26: 4, Biol. 2: 8, 26: *T. spiralis* Chamb. & Iv. 1935, ibid., 28 Pl. 3: 21, 12: 99 & 13: 100 - 105 from Utah (♂♀ New York) = *T. dakota* Chamb. & Gertsch 1958, Bull.

Colorado (♀ New York), n. syn. Described in Dictynidae, selected here as the type genus for the subfamily Tricholathysinae.

There is some geographic variation in most species of this genus, and probably some other species listed and figured by CHAMBERLIN & GERTSCH (1958) are in fact synonymous with the genotype. See also *Arctella*, *Argennina*, *Iviella*, and *Lathys*.

Trichopus C. M. (?) 1834, Mag. Nat. Hist. 7, 10 (not seen); *T. libratus* C. M. 1834, *ibid.* from England (no types). Listed in Agelenidae, for instance, by BONNET (1959), and regarded by him as a nomen dubium. Junior homonym of *Trichopus* Lacépède-Shaw 1802, senior homonym of *Trichopus* Haan 1835 and *Trichopus* Claparède & Lachmann 1859.

Triclaria C. L. Koch 1848, Die Arachniden 15, 101: *T. longitarsis* C. L. Koch 1848, 65 f. 1462 from South America (♀ no types; ♂ described by F. O. PICKARD-CAMBRIDGE 1903 sub *Trechalea longitarsis*). Selected as the type genus for Triclaridae by O. PICKARD-CAMBRIDGE (1877). For later familial affiliation, see *Trechalea*, which is the valid name of this genus. Junior homonym of *Triclaria* Wagler 1834.

Trogloctenus Lessert 1935, Rev. Zool. Bot. Afr. 27: 3, 326: *T. fagei* Less. 1935, *ibid.* f. 1–3 from Congo (♀ type preservation unknown). Described in Ctenidae: Cteninae. Position obscure to me.

Trujillina Bryant 1948, Bull. Mus. Comp. Zool. Harvard 100: 4, 405: *T. spinipes* Bryant 1948, *ibid.* Pl. 9: 84–85 from Hispaniola (♀ Cambridge). Originally assigned to Ctenidae: Calocteninae, transferred here to Acanthoeteninae.

Itatiaga isolata Bryant 1942 (♂♀ Cambridge) = *T. isolata* n. comb. and *Odo hursti* Bryant 1948 (♂ Cambridge) = *T. hursti* n. comb.

Tuberta Simon 1884, Arachn. France 5: 3, 869: *T. insignipalpis* Sim. 1884, *ibid.* f. 806 from France (♂ Paris) = *Coelotes moerens* O. P.-Cambr. 1863, Zoologist 21, 8572 from England (♂ Oxford – not seen; ♀ described by SIMON 1875 sub *Cryphoea moerens*: Paris). Originally assigned to Agelenidae; listed in subfamily Ageleninae since SIMON (1897). Transferred here to Hahniidae: Cryphoecinae. Synonyms *Gillayia* and *Paratetrilys*, both n. syn.

Cryphoea arietina Thor. 1870 (see *Gillayia*) was included in *Tuberta* by CHYZER & KULCZYNSKI (1897), although later authors have not accepted this opinion. For the complicated problems concerning the specific synonymies of this species, see *Gillayia*. Cf. also *Tetrilys*.

Tubitega Kishida 1955 (? 1928), Acta Arachnol. 15: 1, 11: *T. corasina* Kish. 1955, *ibid.* from Japan (neither description nor types).

Listed by original reference in Agelenidae: Ageleninae, tribus Tegenarini. This generic name is here regarded as a nomen nudum (YAGINUMA in litt.), but it may represent a synonym of *Coelotes*.

Tugana Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 17: *Scotolathys cavaticus* Bryant 1940, Bull. Mus. Comp. Zool. Harvard 86: 7, 300 Pl. 5: 64 & 67 from Cuba (♀ Cambridge). Described in Dictynidae (s. str.), transferred to Amaurobiidae by GERTSCH (in ROEWER 1954 a, p. 1375). Transferred here to Amaurobiidae: Altellopsinae.

Tunabo Chamberlin 1916, Bull. Mus. Comp. Zool. Harvard 60: 6, 278: *T. peruvianus* Chamb. 1916, *ibid.* Pl. 22: 7–9 from Peru (juv. ♂ Cambridge). Described in Pisauridae, and listed in Thaumasiinae since PETRUNKEVITCH (1928). Transferred here to Zoridae. Cf. *Xenocetus*.

Tuticanus Simon 1896, Ann. Soc. Ent. France, 65, 494: *T. cruciatus* Sim. 1896, *ibid.* from Ecuador (♀ Paris). Listed in Clubionidae: Cteninae, Ctenaeae by SIMON (1897), and later in Ctenidae: Cteninae.

Several species of *Ctenus* will probably be transferred here.

Uduba Simon 1880, Acta Soc. Linn. Bordeaux 34, 343: *Olios madagascariensis* Vinson 1863, Aran. Réunion. Mauric. Madag., 100 from Madagascar (♂ ? type Paris; ♀ described by SIMON 1906: Paris); the name *U. madagascariensis* is a senior secondary homonym of *Marussenca madagascariensis* F. Dahl 1901 (see below). The genus *Uduba* was described in Clubionidae: Cteninae, and later synonymized with the genus *Uliodon* (here in Miturgidae) by the original author (SIMON 1897). Later he retained its generic rank and transferred it to Zoropsidae (SIMON 1906), where it has since been generally listed except by F. DAHL (1913), who considered *Uduba* as a member of his Zorocratidae. Here it is included in Miturgidae: Uliodonidae. Synonym *Marussenca*.

Uduba dahli Sim. 1903 as a nomen novum for *Marussenca madagascariensis* Dahl 1901 (♂♀ Berlin) = *U. funerea* Sim. 1906 (♀ Paris), n. syn. There is also an undescribed species from Madagascar (♀ Berlin). See also *Zorodictyna*.

Uliodon L. Koch 1873, Arachn. Austr. 1: 1, 431: *U. albopunctatus* L. Koch 1873, *ibid.*, 432 Pl. 34: 2 from Australia (♀ Hamburg). Described in Drassidae, transferred to Clubionidae: Cteninae, group Ctenaeae, by SIMON (1897),

Amer. Mus. Nat. Hist. 116: 1, 19 Pl. 3: 7 from and generally listed in Ctenidae: Cteninae since PETRUNKEVITCH (1928). Selected here as the type genus of Miturgidae: Ulidoninae.

Most of the species of this genus were originally described under the generic name *Zora*. Material of *Zora frenata* L. Koch 1873 (♂ Hamburg; Frankfurt & London), *Z. torva* L. Koch 1873 (♂ Hamburg; juv. ♀ Stockholm), *Z. ferruginea* L. Koch 1873 (♂ Hamburg; juv. ♀ Stockholm), and *U. cerwinus* L. Koch 1873 (♂ Berlin) as well as a great deal of unidentified material (London) has also been examined. However, no attempt is made here to present a specific revision. See also *Amaurobioides* and *Zorodictyna*.

Uloborella Caporiacco 1940, Atti Real. Accad. Ital. 11: 18, 779: *U. strandi* Capor. 1940, ibid. from Ethiopia (type preservation unknown). Described in Uloboridae, and listed in subfamily Uloborinae by ROEWER (1954 a). Status obscure, but regarded here provisionally as a synonym of *Uloborus*.

Uloborus Latreille 1806, Gen. Crust. Insect. 1, 110: *U. walckenaerius* Latr. 1806, ibid. from the Mediterranean region (no types; ♂♀ described by HAHN 1831; Stockholm, Berlin, Geneva & Warsaw). C. L. KOCH (1850) first assigned this genus to Epeiridae, and the older authors generally agreed with him, except that DOLESCHAL (1852) listed *Uloborus* in Theridionidae. THORELL (1870 a) selected this genus as the type of Epeiridae: Uloborinae, and finally O. PICKARD-CAMBRIDGE (1872) created the family Uloboridae. Listed in Uloboridae: Uloborinae since SIMON (1892 a). Synonyms *Phillyra*, *Philoponus*, *Uloborella*, n. syn., and *Veleda*.

As pointed out in connection with *Philoponella*, the specific revision of this subfamily is far from complete. Here are listed only those species whose generic affiliation to the genus *Uloborus*, as defined here, seems to be undisputed.

Oriental, Palearctic and Ethiopian species: *U. plumipes* Lucas 1846 (♀ no types; ♂ described by O. PICKARD-CAMBRIDGE 1876 b sub *U. signatus*, non O. P.-Cambr. 1898; Vienna, Geneva, Paris & coll. PL) = *U. niveivestis* Sim. 1893 (♀ Paris), n. syn., *Orithya gnava* Bl. 1865 (♀ presumably in Oxford; ♂ described by BLACKWALL 1877; Paris) = *U. pictiventris* Sim. 1890 (♀ Paris), n. syn., *U. pinnipes* Thor. 1877 (juv. ♀ Genoa), *U. undulatus* Thor. 1878 (♂♀ Genoa; Basle & Vienna), *U. humeralis* Hasselt 1882 (type preservation unknown; ♂ described by THORELL 1895 sub *U. manicatus*, non Sim. 1893; ♀ ibid. sub *U. omoedus*: Genoa; Vienna), *Philoponus pteropus* Thor. 1887 (type preservation unknown; ♂♀ described by KULCZYNSKI 1908; Paris) = *U. penicillatus* Sim. 1891 (♀ Paris), n. syn., *U. sexfasciatus* Sim. 1892 (juv. ♀ Paris), *U. viridimicans* Sim. 1892 (♀ Paris), *U. pictus* Thor. 1898 (♀ Stockholm), *U. bigibbosus* Sim. 1905 (♀ Paris), *U. furunculus* Sim. 1906 (♀ Paris), *U. oculatus* Kulcz. 1908 (♂ Warsaw), and *Uloborella strandi* Capor. 1940 (type preservation unknown). These species represent several distinct groups, although most of the probable synonyms concern *U. plumipes* Lucas 1846.

Neotropical and Nearctic species: The Nearctic species have been revised by MUMA & GERTSCH (1964), although some of them may be synonymous with previously described species from the northern parts of the Neotropical region. All species mentioned here are close relatives of *U. plumipes* Lucas 1846. *Epeira glomosa* Walck. 1842 (based on a drawing by Abbot; Vienna, Geneva & Paris), *U. villosus* Keys. 1882 (♀ London), *U. aegrotus* Sim. 1892 (♀ Paris), *U. manicatus* Sim. 1893 (♀ Paris), non Thor. 1895, *U. spernax* O. P.-Cambr. 1898 (♀ London), *U. cinereus* O. P.-Cambr. 1898 (♀ London; ♂ described by MUMA & GERTSCH 1964: New York), *U. diversus* Marx 1898 (in BANKS 1898: ♀ types destroyed; ♂ described by MUMA & GERTSCH 1964: New York), *U. minutus* M.-Leit. 1915 (♀ type preservation unknown), *U. ater* M.-Leit. 1917 (♀ type preservation unknown), *U. segregatus* Gertsch 1936 (♂ New York — cf. MUMA & GERTSCH 1964, p. 26 ♀), *U. albolineatus* M.-Leit. 1941 (♂ La Plata — not available), *U. bucki* M.-Leit. 1943 (♀ Rio de Janeiro — not seen), *U. plumipedatus* Rocw. 1951 as a nomen novum for *U. plumipes* M.-Leit. 1947 (♂♀ Rio de Janeiro — not seen), non Lucas 1846, *U. signatellus* Roew. 1951 as a nomen novum for *U. signatus* O. P.-Cambr. 1898 (♂♀ London; Basle), non O. P.-Cambr. 1876. The female of *U. campestratus* Sim. 1892 (Paris) also belongs here, while the corresponding male seems to be a *Philoponella*.

The Australian species described in this genus mainly represent other genera. *U. barbipes* L. Koch 1871 (♀ Hamburg) is a probable synonym of *U. plumipes* Lucas 1846. *U. canus* Mac Leay 1827 (no types) must be transferred to Thomisidae.

See also *Ariston*, *Astavakra*, *Daramulunia*, *Philoponella*, *Polenecia*, *Purumitra*, *Sybota*, *Tangaroa*, and *Zosis*.

Unzickeria n. gen., p. 365: *Hahnna okefinokensis* Chamb. & Iv. 1934, in GERTSCH: Amer. Mus. Novit. 712, 8 f. 22–23 from Georgia (♂♀ New York). Hahniidae: Hahniinae, evidently a relative of *Alistra*.

Bigois tatei Gertsch 1934 (♂♀ New York) = *U. tatei* n. comb. and *Hahnna ernesti*: Petr. 1929 (♀, preservation of material unknown, non Sim. 1897) = *U. naguaboi* n. nov.

Uptiotes (see *Hyptiotes*).

Urepus Roth 1967, Bull. Amer. Mus. Nat. Hist. 134: 5, 341: *U. rossi* Roth 1967, ibid. Pl. 53: 13 from Peru (♀ San Francisco — not seen). Originally assigned to Agelenidae: Cybaeinae, transferred here to Amaurobiidae: Macrobulinae, in which *Urepus* represents an Ecirbellate derivative of *Auximella*.

Urobia Komatsu 1957, Acta Arachn. 14: 2, 67: *U. hexommata* Komatsu 1957, ibid. f. 1 a–d from Japan (♀ type preservation unknown). Described in Agelenidae: Ageleninae as a relative of *Coelotes*, transferred here to Coelotinae, and synonymized with its type genus, *Coelotes*, n. syn.

Uroctea Dufour 1820, Ann. Gén. Sci. Phys. 5, 198: *U. 5-maculata* Duf. 1820, ibid., 200 Pl. 76: 1 from France (♂ no types) = *Clotho durandii*

Walck. 1809 in LATREILLE: Gen. Crust. Insect. 4, 371 from France (no types; ♀ described by SAVIGNY & AUDOUIN 1827: no types; ♂ by WALCKENAER 1837: no types; ♂♀ Budapest). Selected as the type genus for the family Urocteiidae by THORELL (1870 a). Listed here in Oecobiidae: Urocteiinae (cf. *Oecobius*). Synonyms *Clotho* Walckenaer 1809 and *Iphinoe* Rafinesque 1815 (cf. the latter genus).

The specific revision of *Uroctea* has not been completed, but some of the species probably in fact represent new genera. Besides, the fossil species listed by PETRUNKEVITCH (1958) seemingly belong to other genera. Type material of *U. lesserti* Schenkel (♀ Stockholm) and *U. quinquenotata* Sim. 1910 (♀ Berlin) examined. For a list of other recent species, see ROEWER (1942, pp. 385–386) and BENOIT (1966).

See also *Oecobius*.

Urquhartia Bryant 1933, Rec. Canterbury Mus. 4: 1, 9: *Tegenaria livoris* Urquh. 1892 (see *Matachia*). Described in Argyronetidae, transferred to Dictynidae (s. lat.) by B. MARPLES (1962). Listed here in Amaurobiidae: Matachiinae. Synonymous with *Matachia*.

Vagellia Simon 1899, Ann. Soc. Ent. Belg. 43, 101: *V. helveola* Sim. 1899, *ibid.* from Sumatra (♀ Paris). Orthography corrected to *helvola* by BONNET (1959). Described in Agelenidae: Cybaeinae, transferred here into Zoridae. Synonymous with *Zoica*, n. syn.

Valcheta Mello-Leitão 1940, Rev. Mus. La Plata, N. S. 2, Zool., 20: *V. rastellijera* M.-Leit. 1940, *ibid.* f. 18–20 from the Argentine (♀ La Plata – not seen). Described in Agelenidae: Cybaeinae, transferred to Zodariidae by ROTH (1964).

MELLO-LEITÃO (1943 a) described another species, *V. palida*, which is also a Zodariid one.

Varyna Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 17: *Dictyna mulegensis* Chamb. 1924, Proc. Calif. Acad. Sci., 4. Ser. 12, 582 f. 7–9 from Baja California (♂ San Francisco – not seen; ♀ described by GERTSCH & DAVIS 1937: New York). Dictynidae: Dictyninae. Synonymous with *Phantyna*.

Veleda Blackwall 1859, Ann. Mag. Nat. Hist., 3. Ser. 3, 95: *V. lineata* Bl. 1859, *ibid.* from Europe (♀ presumably no types) = *Uloborus walckenaerius* (see *Uloborus*). Described in Cini-flonidae. For later position, see *Uloborus*, which is senior synonym of this genus. Senior homonym of *Veleda* Stål 1865 and *Veleda* Conrad 1870.

Vidole n. gen., p. 330: *Auximus capensis* Poc. 1900, Ann. Mag. Nat. Hist., 7. Ser. 6, 323 from

South Africa (♀ London; det. PL: ♂♀ London, Berlin, Hamburg & Geneva) = *A. schreineri* Purc. 1905, Trans. S. Afr. Phil. Soc. 15: 3, 131 Pl. 10: 1 from South Africa (♂♀ Cape Town), n. syn. = *Amaurobius promontorii* Sim. 1906, Ann. Ent. Soc. Belg. 50, 294 from South Africa (♀ Paris), n. syn. Amaurobiidae: Phyxelidinae.

There is also an undescribed species (♂ Berlin).

Viracucha n. gen., p. 377: *Acanthoctenus andicola* Sim. 1906, Ann. Soc. Ent. Belg. 50, 291 f. 2 d–e from Bolivia (♂♀ Paris) = *A. sa-raensis* Str. 1910, Zool. Jahrb., Syst. 28: 4, 408 from Bolivia (♂ Berlin – non ♀: *Nothroctenus marshii*), n. syn. Ctenidae: Acanthocteninae.

A. ridleyi F. O. P.-Cambr. 1897 (♀ type preservation unknown) = *V. ridleyi* n. comb., *A. exilis* M.-Leit. 1936 (♀ type preservation unknown, non ♂: *Nothroctenus* sp.) = *V. exilis* n. comb., *A. paraguayensis* Str. 1909 (♀ Berlin) = *A. bahiensis* Str. 1909 (♀ Berlin), n. syn. = *V. paraguayensis* n. comb., *A. misionensis* M.-Leit. 1945 (♀ La Plata – not available) = *V. misionensis* n. comb., *A. silvicola* Soares & Soares 1946 (♀ type preservation unknown) = *V. silvicola* n. comb.

A. maculatus Petr. 1925 (juv. ♀ type preservation unknown; det. PL: London) probably also belongs to this genus.

Virgilus Roth 1967, Bull. Amer. Mus. Nat. Hist. 134: 5, 342: *V. normalis* Roth 1967, *ibid.* Pl. 53: 14 from Ecuador (♀ San Francisco – not seen). Described in Agelenidae: Cybaeinae, listed here as Amaurobiidae incertae sedis; most probably a representative of Macrobulinae.

Viridasius Simon 1889, Ann. Soc. Ent. France, 6. Ser. 8, 233: *V. pulchripes* Sim. 1889, *ibid.* from Madagascar (♂ Paris) = *Phoneutria fasciata* Lenz 1886, Zool. Jahrb., Syst. 1: 2, 404 Pl. 10: 7 from Madagascar (♂♀ Berlin; ♀ Paris). Originally assigned to Drassidae, and listed by SIMON (1897) as a synonym of *Vulsor* in Clubionidae: Liocraninae, Miturgae. For later familial affiliation, cf. *Vulsor*. Selected here as the type genus of Ctenidae: Viridasiinae.

Voraptus Roewer 1954, Explor. Parc Nat. Upemba 30, 395: *V. agilis* Roew. 1954, *ibid.*, 396 f. 169 from Mozambique (♀ type preservation unknown). Originally assigned to Pisauridae: Thaumasiinae. Listed here in Dolomedidae.

Voraptus Simon 1897, Ann. Soc. Ent. France 66, 385: *Dendrolycosa tenella* Simon. 1893, Bull. Soc. Zool. France 18, 208 from Seychelles, Indian Ocean (♂♀ Paris). Originally assigned to Pisauridae: Dolomedae, and since PETRUN-

KEVITCH (1928) listed in subfamily Thaumasiinae. Transferred here to Zorididae, closely related to the two-clawed genus *Thasyraea*.

Vulsor Simon 1888 [1889], Ann. Soc. Ent. France, 6. Ser. 8, 233: *V. bidens* Sim. 1888, *ibid.* from Comores, Indian Ocean (♀ Paris). Originally assigned to Drassidae, and listed in Clubionidae: Liocraninae, Miturgeae by SIMON (1897). PETRUNKEVITCH (1928) transferred it into Ctenidae: Cteninae, and since then it has always been listed there. Listed here in Ctenidae incertae sedis, but most probably it is a subfamily of its own, and a recent derivative of some Cribellate branch of Ctenidae.

A complete specific revision has not been carried out. *V. sextus* Str. 1907 (♀ Berlin) and *V. septimus* (♀ Berlin) are very closely related species, or perhaps synonymous with each other. See also *Viridasius*.

Wadotes Chamberlin 1925, Proc. Biol. Soc. Wash. 38, 120: *W. dixiensis* Chamb. 1925, *ibid.* from Alabama (♂ Cambridge; ♀ described by MUMA 1947: New York). Described in Agelenidae: Ageleninae, transferred here to Coelotinae. Cf. also MUMA (*op. cit.*).

A specific revision of this genus has been presented by MUMA (*op. cit.*). Material of *Coelotes calcaratus* Keys. 1887 (♂♀ type preservation unknown; Portal) examined. *W. primus* Fox 1936 (♀ New York) belongs to an undescribed genus. There is also an undescribed species from Taiwan (♀ Berlin).

Wajane n. gen., p. 390: *W. armata* n. sp., p. 409 f. 470 – 471 from South Africa (♂ Geneva). Eresidae: Penestominae.

Walmus Chamberlin 1947, Bull. Univ. Utah 38: 8, Biol. 10: 5, 10: *W. barbarus* Chamb. 1947, *ibid.*, 11 Pl. 1: 5 – 8 from California (♀ New York). Amaurobiidae: Amaurobiinae.

CHAMBERLIN (1947) presented a specific revision of this genus. The species can be classified into two distinct groups:

I. *barbarus* group. *W. dorotheae* Chamb. 1947 (♀ New York), *W. mathetes* Chamb. 1947 (♂♀ New York), *Amaurobius borealis* Emert. 1919 (♂♀ New York, Paris & Helsinki), *W. mephisto* Chamb. 1947 (♀ New York), and *W. oblitus* Chamb. 1947 (♀ New York).

II. *lutescens* group. *Auximus lutescens* Chamb. 1919 (♂♀ type preservation unknown; New York), *W. hagiellus* Chamb. 1947 (♀ New York), *W. hermosus* Chamb. 1947 (♀ New York), *W. agastus* Chamb. 1947 (♀ New York), *W. varus* Chamb. 1947 (♂ New York), and *W. heathi* Chamb. 1947 (♂♀ New York).

Xenoctenus Mello-Leitão 1938, Rev. Mus. La Plata, Zool. 1: 4, 101: *X. unguicularis* M.-Leit. 1938, *ibid.* f. 16 – 17 from the Argentine (♀ La Plata – not available). Originally assigned to Ctenidae; and listed by ROEWER (1954 a)

and by BONNET (1959) in Cteninae. Transferred here to Zorididae. Most probably a synonym of *Tunabo*.

Recently revised by CARCAVALLO & MARTINEZ (in press). Material of *Xenoctenus marmoratus* M.-Leit. 1941 (♂ London – det. Mello-Leitão) and *X. sp.* from Galapagos Isl. (♂ London – det. PL) examined.

Xevioso n. gen., p. 330: *Haemilla tuberculata* Lawr. 1939, Ann. Natal Mus. 9: 2, 276 f. 5 from Zululand, South Africa (♂♀ Pietermaritzburg). Amaurobiidae: Phyxelidinae.

Themacrys stolidus Sim. 1906 (♂ Paris) = *X. stolidus* n. comb., and *Haemilla zuluana* Lawr. 1939 (♂ Cape Town – not seen) = *X. zuluana* n. comb. There is also an undescribed species (♀ Berlin).

Xingusiella Mello-Leitão 1940, Ann. Ac. Bras. Sci. 12: 1, 23: *X. minima* M.-Leit. 1940, *ibid.* f. 1 from Brazil (♀ type preservation unknown). Originally assigned to Pisauridae, and listed by ROEWER (1954 a) in Thaumasiinae. Transferred here to Amaurobiidae: Rhoicininae.

Yacolla n. gen., p. 338: *Y. pikelini* n. sp., p. 407 f. 183 and 190 from Brazil (♀ Paris). Amaurobiidae: Altellopsinae.

Yorima Chamberlin & Ivie 1942, Bull. Univ. Utah 32: 13, Biol. 7: 1, 20: *Chorizomma sequoiae* Chamb. & Iv. 1937, Ann. Ent. Soc. Amer. 30: 2, 217 Pl. 4: 29 from California (♀ New York; ♂ described by ROTH 1956 a: New York). Described in Agelenidae: Ageleninae, transferred here to Dictynidae: Cicurinae. Synonym *Ameromma*, n. syn.

ROTH (1956 a) presented a specific revision of *Yorima*. Material of *Y. angelica* Roth 1956 (♂♀ New York; Portal) examined.

Yupanquia n. gen., p. 336: *Y. schiapellii* n. sp., p. 406 f. 148 from Tucuman, the Argentine (♀ Paris). Amaurobiidae: Macrobulinae.

Zaitunia n. gen., p. 300: *Filistata schmitzii* Kulcz. 1911, Bull. Acad. Sci. Cracov., 13 Pl. 1: 3 from Israel (♂♀ – ♂ Warsaw). Orthography corrected to *schmitzi* by REIMOSER (1919). Filistatidae.

The specific revision of the Filistatids of the Mediterranean region has not been completed, and there are probably additional members of this genus.

Zanomys Chamberlin 1948, Bull. Univ. Utah 38: 15, Biol. 10: 6, 17: *Z. kaiba* Chamb. 1948, *ibid.*, 18 Pl. 6: 61 – 62 from Utah (♂♀ New York). Described in Dictynidae (s. str.), transferred to Amaurobiidae by GERTSCH (in ROEWER

1954 a, p. 1376). Transferred here to Amaurobiidae: Macrobulinae.

Dictyolathys californica Banks 1904 (♀ originally New York – destroyed; ♂♀ New York & Basle). See also *Lathys*.

Zobia Thorell 1895, Descr. Catal. Spid. Burma, 54: *Z. parvula* Thor. 1895, ibid. from Burma (♀ Stockholm; London). Objective synonym of *Zoica* (see below). Junior homonym of *Zobia* Saalmüller 1890.

Zodarion Walckenaer 1825, in Savigny & Audouin: Explic. Planch. Arachn. Savigny Descr. Egypt. 1: 4, 135. The first publishing of this name is parallel to *Thomisoides* (cf. *Sicarius*), but as *Enyo* is a junior homonym, *Zodarion* has long been established for this genus. For a different opinion concerning the orthography, see BONNET (1959, p. 4969 and 1970), and for generotype, see *Enyo*. In fact, this genus has not been listed in Agelenidae under this name. O. PICKARD-CAMBRIDGE (1872 and elsewhere) placed the genus *Enyo* in his Agelenidae, and since THORELL (1881) this genus has always been listed as the type genus of Zodiariidae-Zodariidae. DENIS (1935 a, 1935 b) presented a revision of European species, and I have personally examined several European species in different museums. They seem to be congeneric.

Zoica Simon 1896, Hist. Nat. Araign. 2: 2, 248 as a nomen novum for *Zobia* Thorell 1895 (see above). Described in Agelenidae: Ageleinae, transferred here to Zoridae, where it may represent a subfamily of its own (cf. p. 374). Synonyms *Vagellia*, n. syn. and *Zobia* Thor. 1895.

Vagellia helvola Sim. 1899 (♀ Paris) = *Zoica helvola* n. comb.

Zora C. L. Koch 1848, Die Arachniden 14, 102: *Lycaena spinimana* Sundev. 1832, K. Vet. Akad. Handl. 1832, 266 from Sweden (♀ no types; ♂ described by BLACKWALL 1833 sub *Hecarge maculata*; ♂♀ coll. PL). Originally assigned to Drassidae. It has been listed in various groups – Drassidae: Zorinae (F. O. PICKARD-CAMBRIDGE 1893), Clubionidae: Cteninae (SIMON 1897), Zoridae (F. DAHL 1912 and later), Ctenidae: Acantheinae (PETRUNKEVITCH 1928, etc.), Ctenidae: Calocteninae (MELLO-LEITÃO 1939), Clubionidae: Liocraninae (KASTON 1948), or even Lycosidae (DAHL & DAHL 1927). Here it is listed in Zoridae. Synonyms *Hecarge*, *Katadysas*, *Lycaena* Sundevall 1832, *Lycodia*, and *Psilothra*.

TULLGREN (1946) and LOCKET & MILLIDGE (1951) presented a modern revision of the European species of *Zora*. Material of *Hecarge nemoralis* Bl. 1861 (♂♀ Oxford – not seen; coll. PL), *Z. parallela* Sim. 1878 (♂♀ Paris; coll. Koponen), and *Z. silvestris* Kulcz. 1897 (♂♀ type preservation unknown; ♀ Helsinki) examined. See also *Apostenus*, *Uliodon*, and *Zoropsis*.

Zorocrates Simon 1888, Ann. Soc. Ent. France, 6. Ser. 8, 212: *Z. fuscus* Sim. 1888, ibid. from Central America (♀ Paris; ♂ described by O. PICKARD-CAMBRIDGE 1892 sub *Satricum gnaphosoides*: ♂♀ London; ♀ Vienna & det. PL: Berlin). Described in Zoropsidae, and generally listed there, except by F. DAHL (1913), who selected it as the type genus of the family Zorocratidae. Listed here in Miturgidae: Tengellinae. Synonyms *Lycodrassus* L. Koch 1902 and *Satricum*.

A list of species described up to date is found in ROEWER (1954 a, p. 1283 – 1284). Material of *Z. badius* Sim. 1895 (♀ Paris; det. PL: Stockholm), and *Z. isolatus* Gertsch & Davis 1936 (♀ New York; ♂ New York) examined. See also KRAUS (1955).

Zorodictyna Strand 1907, Zool. Anz. 31: 23, 275: *Z. intermedia* Str. 1907, ibid. from the island Nosy Bé, adjacent to Madagascar (♀ originally in Lübeck – destroyed) = *Uduba inhonesta* Sim. 1906, Ann. Soc. Ent. Belg. 50, 294 from Nosy Bé (♀ Paris), n. syn. Described as an intermediate genus between Zoropsidae and Dictynidae, generally listed in Zoropsidae since PETRUNKEVITCH (1928). Transferred here into Miturgidae: Uliodoninae.

Agroeca oswaldi Lenz 1891 (♂♀ Hamburg) = *Z. oswaldi* n. comb.

Zoroides Berland 1924, Nova Caledonia Zool. 3: 2, 235: *Z. dalmasi* Berl. 1924, ibid. f. 168 – 173 from New Caledonia (♀ type preservation unknown). Originally assigned to Clubionidae, and listed by PETRUNKEVITCH (1928) in the subfamily Liocraninae, but transferred by ROEWER (1954 a) to Ctenidae: Acantheinae. Listed here in Zoridae, close to *Hestimodema* and *Odomasta*, or probably synonymous with either of them.

Zoropsis Simon 1878, Arachn. France 4, 327: *Dolomedes ocreatus* C. L. Koch 1841 in WAGNER: Reis. Regent. Algier 3, 212 Pl. 10 from Algeria (♀ no types) = *D. spinimana* Dufour 1820, Ann. Gén. Sci. Phys. 5, 204 Pl. 76: 3 from the Mediterranean region (♀ no types; ♂ described by WALCKENAER 1841 sub *D. dufourii* Walck. 1837; ♂♀ Berlin, Stockholm & Paris) = *Z. oertzeni* F. Dahl 1901, Sitz.-Ber. Ges. naturf. Fr. Berlin 1901: 9, 192 from Albania (♀ Berlin), n. syn. = *Z. quedenfeldti* F. Dahl 1901, ibid. from Morocco (♀ Berlin), n. syn. = *Z. triangularis* F. Dahl 1901, ibid., 194 from Tangier, North Africa (♀ Berlin), n. syn. = *Z. pluridentata* Frang.-Balb. 1925, Bol. Soc. Ent. España 8, 40 from

Spain (♂ type preservation unknown), n. syn. Selected as the type genus for the family Zoropsidae by original description, transferred here to Zoridae, cf. also *Lycosoides*.

I. *spinimana* group. *Z. bilineata* Dahl 1901 (♀ Berlin; ♂ described by KULCZYNSKI 1909) = *Z. xylinea* Sim. 1909 (♀ Paris) and *Z. pekingensis* Schenkel 1953 (♀ Tientsin—not seen).

II. *lutea* group. *Zora lutea* Thor. 1875 (♂♀ ? type Stockholm; Helsinki & Warsaw), *Zoropsis media* Sim. 1878 (♂♀ Paris) and *Olios rufipes* Lucas 1838 (♂ no types; ♂♀ described by SIMON 1880 c sub *Zoropsis rufipes*: type preservation unknown; Hamburg, Oulu & coll. PL.) = *Z. maculosa* O. P.-Camr. 1907 (♀ presumably in Oxford). This synonymy was first proposed by SCHMIDT (1956 a).

The status of *Z. beccarii* Capor. 1935 from Turkey is obscure, but most probably it is a synonym of either the generotype or *Z. lutea*. See also *Takeoa*.

Zosis Walckenaer 1841, Hist. Nat. Ins. Apt. 1, 202: *Z. caraiba* Walck. 1841, ibid. Pl. 20: 2 from the tropics (♂ no types) = *Aranea geniculata* Oliv. 1789, Encycl. Méthod. 4, 214 from

the tropics (no types; ♀ described by BLACKWALL 1858 sub *Orithyia williamsii*: no types; ♂♀ Stockholm, Berlin, Paris, Warsaw, Basle & Geneva). Usually regarded as synonymous with *Uloborus*, and thus listed in Uloboridae: Uloborinae. Synonym: *Orithyia* Blackwall 1858.

The Nearctic species have been revised by MUMA & GERTSCH (1964), but they are also listed here. As the generotype is very variable in colouration and shape of the abdomen, it is possible that there are additional synonyms among the numerous species described in *Uloborus*.

Uloborus sinensis Sim. 1880 (♂♀ Paris; det PL: Osaka II) = *U. octonarius* Muma 1945 (♂♀ New York—not seen), n. syn. (cf. MUMA & GERTSCH *op. cit.*, p. 37) = *Z. sinensis* n. comb., *U. varians* Bös. & Str. 1906 (♀ Frankfurt; Osaka II) = *U. defectus* Bös. & Str. 1906 (♀ Frankfurt), n. syn. = *U. dubius* Bös. & Str. 1906 (♀ Frankfurt) = *Z. varians* n. comb., *U. sybotides* Bös. & Str. 1906 (♂♀ Frankfurt; ♀ Osaka II) = *Z. sybotides* n. comb., *Argyrodes yesoensis* Saito 1934 (♂♀ type preservation unknown; ♀ Osaka II) = *Z. yesoensis* n. comb., *U. costa-limae* M. Leit. 1917 (♂♀ type preservation unknown) = *Z. costa-limae* n. comb., *U. ursinus* M.-Leit. 1947 (♀ Rio de Janeiro—not seen) = *Z. ursinus* n. comb., and *U. mundior* Chamb. & Iv. 1936 (♂♀ New York) = *Z. mundior* n. comb.

IV. Phylogenetic classification of Araneomorpha

1. Historical review

In the dawn of taxonomic zoology, all known species of spiders were included in a single genus, called *Araneus* by CLERCK (1757) and *Aranea* by LINNÉ (1758). Both of these authors strictly supported the opinion that all species of animals had been created in their present form, although the existence of some evolution was anticipated by some zoologists of their time.

The creation of most of the classical spider genera was the work of LATREILLE (1804) and WALCKENAER (1805), and the former also selected the first generotypes (LATREILLE 1810). Indeed, most of their genera correspond to present families. These authors also presented the first classifications of spiders above the generic level; the names of the resulting groups were determined by ecological characters and none of them is valid according to the current code of nomenclature. For details of these and other schemata of similar type, see THORELL (1870–1873), SIMON (1892–1903), and BONNET (1959).

A few of the well-known families were created by SUNDEVALL (1833: Lycosidae, Theridiidae and Thomisidae, as well as the names Attidae, Drassidae, Epeiridae, and Mygalidae, now in-

valid), C. L. KOCH (1837: Agelenidae and Dysderidae, 1851: Eresidae, Dinopidae and Pholcidae), BLACKWALL (1841 b: Salticidae, 1859: Linyphiidae, 1862: Oecobiidae, 1864: Scytodidae), MENGE (1866: Tetragnathidae), and AUSSERER (1867: Filistatidae). The name Archaeidae was originally reserved for fossil species only by KOCH & BERENDT (1854).

The main work of arranging the recent genera into families and subfamilies was done by THORELL (1870 a, 1870–1873, 1886, 1887) and SIMON (1864, 1881, 1884 a, 1889, 1890 b, 1892–1903, 1874–1937). Since their extensive work at beta level of spider taxonomy, only a few generally accepted groups of family rank have been presented for recent spiders.

The original subdivision of spiders remained practically unaltered until the first schemata of MENGE (1866) and THORELL (1870 a). Thereafter the concept of evolution, or at least of micro-evolution within certain groups, was gradually accepted. Unfortunately, the consequences were not merely advantageous for the development of the classification of the order Araneae. In most cases the main groups were created and named according to a single character, and the principal grounds for dispute lay in different interpretations of the sequence of the taxo-

nostic importance of the characters used. Altogether, these facts led to increasing instability in the classification of spiders.

The schemata of all the main classifications up to 1939 have been listed by BONNET (1959, pp. 5017–5034), and their argumentation has been analyzed by PETRUNKEVITCH (1933), BRISTOWE (1938), and CAPORACCO (1938). Thus only the origin of the names and different concepts of the limitation of phylogenetically important groups are discussed here, and a rough summary is given of the type of characters used in spider taxonomy above the generic level.

Segmented spiders of Liphistiidae were originally classified along with other four-lunged families, until Pocock (1892) separated the suborders Mesothelae and Opisthothelae. These names, however, are given according to the position of the spinnerets. The «mesothelic» pattern of Prodidomidae suggests the suppression of Pocock's names, and PETRUNKEVITCH (1923, p. 151) replaced Mesothelae by Liphistiomorphae.

The four-lunged spiders, «tarantulas», were separated as an independent group, Mygales, by LATREILLE (1802), according to general appearance, size, and habits, but their anatomical divergence was first emphasized by THORELL (1886), who created the concepts Tetrapneumones and Dipneumones. Finally, L. BERLAND (1932) proposed the widely used names Orthognatha and Labidognatha for almost identical groups. Both these groupings have been slightly relimited by subsequent authors, and in fact these names have been applied to monophyletic entities. Strictly speaking, all these four names are misleading on account of some exceptions within the suborders. Therefore, the names Theraphosomorpha and Araneomorpha are preferred here as the names of suborders, although they were first used by CAPORACCO (1938) for lower categories. The old name Mygalomorphae (Pocock 1892) is inappropriate, as the generic name *Mygale* has long been invalid.

BERTAKAU (1878) was the first to carry out comparative studies on the structure and patterns of the respiratory organs, and created the concepts Tristicta and Tetrasticta, based on the number of external stigmata. Although the fusion of paired stigmata may have occurred several times independently, it is obvious that this grouping is practical in the preliminary analysis of spider phylogeny. Additional data about the

patterns of the respiratory organs later led to the creation of a whole suborder, Apneumonomorphae, and two lower groups, Proterotracheatae and Deuterotracheatae, classified according to the evolution of the respiratory organs only (PETRUNKEVITCH 1933). However, the presence of a general trend towards the development of tracheae instead of book-lungs, and the correlation of the reduction of the respiratory organs in general with the decrease in size was proposed by BRISTOWE (1938, pp. 294–295), CAPORACCO (1938, p. 74), LEVI (1956, p. 1, and in the press), and GERTSCH (1960, p. 2–3).

The presence of the cribellum was first used by BERTKAU (1882) as a character of higher categories. Different opinions concerning the phylogenetic value of this structure and its homologies are discussed later in this chapter and in chapter VI.

The phylogenetic significance of SIMON's (1892 a) group Haplogynae has been severely criticized by PETRUNKEVITCH (1923, 1933), but SIMON's grouping has been widely accepted during this century, and it seems to be more uniform than was suggested by PETRUNKEVITCH. On the other hand, the parallel group, Entelegynae, must be relimited in order to become a practical, polyphyletic unit comparable to, e.g., Myriopoda. Cf. also the opinion of MACHADO (1951, 1964).

The division of Ecribellata into Haplogynae and Entelegynae was based solely on the relative complexity of the genital structures in both males and females, but not at all on the evolution of the different structural details of these organs. Moreover, the complicated structural patterns afforded by the genital organs of the «Entelegyne» spiders in particular, have since been generally ignored in the compilation of new classifications, or their taxonomic value has been categorically denied: «The reproductive system in spiders does not furnish any characters which could be used for the separation of spiders into large groups. The value of the male palp and female epigynum has long been recognized as of primary importance in the identification of species» (PETRUNKEVITCH 1933, p. 322). The schema of ARCHER (1948) is a unique attempt to use genital details in a large scale classification but, unfortunately, his excellent idea failed because he neglected to draw sufficient attention to convergent evolution. Genital characters were used later, at family level, by LEVI (1961) and LEVI & LEVI (1962).

The concepts *Trionycha* and *Dionycha* (PETRUNKEVITCH 1928) have generally been accepted in later classifications, although the genera *Mnesitheus*, *Uduba*, *Cupiennius*, *Dasumia*, and *Nops* have caused difficulties by having a different number of claws in the first pair of legs and in the posterior pairs. Indeed, the number of tarsal claws is a practical key character in some superfamilies, and was first used in keys by Pocock (1900). The adaptive characters of the distal parts of the legs were also utilised for the subdivision of Theraphosomorph spiders by PETRUNKEVITCH (1928) in creating the groups Hypodemata and Nelipoda, which, however, have not been established.

The significance of internal characters other than respiratory organs was best conceived by PETRUNKEVITCH (1933), and that of ontogenetic characters by HOLM (1940). They collected the scattered data available from these disciplines of biology, and themselves contributed numerous new details. As a result of his basic work, PETRUNKEVITCH (1933) created the groups Octostriatae, Sexostriatae, and Quadrostriatae according to the number of cardiac ostia, and these groups were later accepted, e.g., by HICKMAN (1939, 1940, 1944, 1945, 1949) and MILLOT (1933 c). MILLOT (1933 a, 1933 b) also argued some taxonomic changes from other internal characters. Ontogenetic characters have been sporadically used as auxiliary characters by most of the authors who have presented large scale classifications, but a consistent synthesis of their phylogenetic evidence has never been carried out.

Furthermore, a considerable amount of information is available about the cytological characters of spiders (MAKINO 1951, p. 60–70), but comparative analysis of the taxonomic value of these characters has been carried out only by HACKMAN (1948), SUZUKI (1951, 1952, 1954), and MITTAL (1961, 1963). Their conclusions prove that infrageneric variation both in the number and shape of chromosomes, as well as in the mechanism of sex determination, is too high for a general use to be made of these characters above the specific level. However, their auxiliary value in some cases is generally known.

According to the fundamental principles of the study of evolution and palaeontology, the fossil remnants of any group constitute the only direct proof of the evolution of the corresponding group in the past. In spite of this, most of the classifications of spiders that have been

presented up till now are wholly based on information acquired from recent species. Separate fossil species of spiders have been described by numerous authors, but often they are simply placed with recent genera and families. Even some species from the Palaeozoic era have been so placed. The necessity of creating higher taxa for some fossil forms was, however, comprehended by KOCH & BERENDT (1854), THORELL (1870 a, 1890), SCUDDER (1886), and FRITSCH (1904). Finally, thanks to PETRUNKEVITCH (1913, 1922, 1942, 1946, 1950, 1958, 1963), it became possible to make effective use of palaeontological data for phylogenetic studies.

The phylogenetic value of ethological characters has been discussed by a few authors only, but PETRUNKEVITCH (1926) showed their usefulness for taxonomic purposes. He was well aware of their restricted power as evidence, but KASTON (1964) totally failed in trying to compile an evolutionary classification of spiders on the basis of ethological characters only.

Summarizing the advantages and drawbacks of the most important classifications up to date, it is evident that the principles of BRISTOWE (1938) are the most correct. I am in complete agreement with him, when he writes (*op. cit.*, p. 287) «the cumulative evidence of all differences and resemblances provides a more satisfactory guide to relationships than the arbitrary selection of individual characters», and (*op. cit.*, p. 289) «changes in one character take place independently of changes in another... change in one character alone (...) may at first be only of specific or generic importance unless, or until, other structural modifications increase the gulf between the ancestral stock and the descendant... a character which shows constancy in one genus, family, or suborder cannot be relied upon to show constancy in another genus, family, or suborder», and further (*op. cit.*, p. 290), «In the course of evolution similar results have been arrived at independently over and over again. The facts (a) that this can often be detected and (b) that a close investigation, more particularly of complicated structures, shows that apparently similar results are not always homologous, should serve as a warning against regarding one character alone as proof of relationship».

There seem to be two main reasons for the fact that I cannot agree with BRISTOWE concerning the resulting classification. Firstly, he treated the classical families as sanctified enti-

ties, whose limitation cannot be doubted. Thus he also stipulated that when a character had been analyzed by some previous author in a few representatives of some of these classical families, these results could be applied to the whole family as limited before. Furthermore, BRISTOWE seemingly investigated personally only a rather limited number of representatives of subfamilies and families, and thus he was probably repeatedly misled by the errors of previous authors (cf., e.g., the key by BRISTOWE *op. cit.*, p. 303).

PETRUNKEVITCH (1933 and others) was distinguished for his excellent personal knowledge of the external morphology, anatomy, ethology, and paleontology of most families and subfamilies, but as was emphasized by BRISTOWE (*op. cit.*) he did not adopt the general principles of phylogenetic classification cited above.

GILTAY'S (1925) schema is altogether remarkably correct in several details and also partly so in rough outline. However, his argumentation is scanty, and most probably his personal acquaintance with most of the rare groups was decidedly inferior to that of SIMON, BRISTOWE, and PETRUNKEVITCH.

CAPORACCO (1938) seems to have accepted the principles of PETRUNKEVITCH as such, and his aim was obviously to make some corrections only in the details of the basic schema of the latter author.

MELLO-LEITÃO (1941 a) tried to summarize the results of the numerous classifications that had been published from 1933 to 1941, including also the textbook of GERHARDT & KÄSTNER (1938 – 1941). He was further influenced by a better knowledge of Theraphosomorph spiders than any of his predecessors. These facts are reflected in his schema, and the subdivision of Theraphosomorpha shows distinct progress. As regards Araneomorpha, his reliance upon data collected by previous authors has caused much confusion (cf. his key on pp. 109 – 113).

Concerning the largest superfamily of the present study, Amaurobioidea, the limitation and subdivision of Agelenidae (as understood at that time) by THORELL (1870 a, 1870 – 1873) is superior to any later classification, although the overemphasis on the taxonomic value of the cribellum later misled the author himself (THORELL 1886). Nor has his original schema been supported by any subsequent author because of their inordinate trust in the authority of SIMON. The subdivision of Agelenidae by

F. O. PICKARD-CAMBRIDGE (1893) is also worth mentioning here.

2. The Cribellata as a taxonomic concept

The presence of an inframamillary organ was first detected by BLACKWALL (1833), but during the following decades its taxonomic value was still not emphasized, and species with this structure were scattered among Drasidae, Agelenidae, and Theridiidae, at least. Gradually the name cribellum was established for this structure.

BERTKAU (1882) was the first to use the cribellum as a key-character between some major groups of spiders. He also created the terms Cribellata and Ecribellata to refer to taxonomic categories. However, this way of using these concepts was not immediately stabilized, as THORELL (1886) used these names for further subdivision of both his Tubitelariae and Orbitelariae.

Since SIMON (1892 – 1903) the position and mutual relations of the different Cribellate families has been one of the central problems in the classification of spiders. In his schema (1892 a, p. 61) Cribellata constitutes one of the primary subdivisions of the suborder Araneae verae, and Ecribellata the other. Consequently, all his families were either Cribellate or Ecribellate. This practice has since been generally adopted by almost all arachnologists, even by those who differ most radically as regards the general outline of the classification, e.g., PETRUNKEVITCH.

After this basic work of SIMON (*op. cit.*), an alternative, a close relation between some Cribellate and the corresponding Ecribellate families, was first proposed by F. O. PICKARD-CAMBRIDGE (1902, p. 351). He did so with some reservations, as he regarded cribellum and calamistrum as being of comparatively recent origin. The great resemblance in general appearance between some Cribellates and Ecribellates was later emphasized by PETRUNKEVITCH (1923, p. 159), who first suggested that at least some of the Ecribellate families are derivatives of the Cribellate ones, and not vice versa: «we have before us a complicated process by which at different times both new cribellated and ecribellated families were produced from the original three-clawed cribellated ones».

PETRUNKEVITCH (*loc. cit.*) also correctly interpreted the stage of the origin of the cribellum

in the evolution of spiders: «the ancestors of Arachnomorph spiders all possessed a cribellum and had three claws on their tarsi». There are no vestiges of the homologues of the anterior median spinnerets in any of the known Theraphosomorph spiders, and thus it is obvious that these have been reduced without intermediate stages of specialized function.

Although PETRUNKEVITCH thus had a perfectly correct view of the course of evolution of the cribellum, he was later misled as regards the taxonomic and phylogenetic value of some other characters that undergo gradual reduction (PETRUNKEVITCH 1933 and later).

When BERTKAU (1882) united all the Cribellate families, they were nine in number: Zoropsidae, Uloboridae, Miagrammopidae, Filistatidae, Oecobiidae, Dinopidae, Dictynidae, Eresidae, and Amaurobiidae. Neither four-lunged nor segmented Cribellate spiders were known then.

The discovery of Hypochilidae (MARX 1888) and Arthrodictynidae (PETRUNKEVITCH 1942) has necessitated a change of opinion concerning the mutual relations of the Cribellate families. The presence of two pairs of lung-books in Hypochilids has generally been considered sufficient for the creation of a separate superfamily, at least by BRISTOWE (1938). On the other hand, CAPORACCO (1938) proposed a higher taxon, cohorts, for this group that he named Palaeocribellata. This opinion has since been supported, e.g., by BONNET (1959). PETRUNKEVITCH (1933) transferred Hypochilidae to a suborder of its own, Hypochilomorpha, and MELLO-LEITÃO (1941 a) supported this opinion. Under these circumstances, it is surprising that GERTSCH (1958) included both four-lunged and two-lunged species in Hypochilidae.

The rest of the Cribellate families were arranged in three superfamilies – Filistatoidea, Dinopoidea, and Dictynoidea – by BRISTOWE (*op. cit.*), while in the system of CAPORACCO (*op. cit.*) and BONNET (1959) the number of superfamilies was six. However, the only fundamental difference between the latter authors and BRISTOWE was the placing of Dictynidae. CROME (1955 a) raised the group Neocribellata to suborder rank.

As a rule, the supporters of the basic ideas of PETRUNKEVITCH (1933) scattered the Cribellate families among the other Araneomorph spiders, but an interesting exception is afforded by MELLO-LEITÃO (1941 a). He divided Araneomorpha into ten superfamilies, and the fourth

of them, Dictynoidea, consisted solely of Cribellate spiders: Uloboridae, Dictynidae, Dinopidae, Amaurobiidae, Psecchridae, and Tenggellidae, while Oecobiidae, Filistatidae, Acanthoctenidae, and Zoropsidae were classified as close relatives of Ecibellate spiders.

In all classifications of spiders with intermediate categories between suborder and family, or between the group Cribellata and family, the two-clawed Cribellate families Acanthoctenidae and Zoropsidae have been kept separate from all three-clawed families. For the differences in evaluation of the other auxiliary characters in the subdivision of Cribellata, see the argumentations in the papers mentioned above.

The definition and limitation of single Cribellate families is discussed later in this chapter.

3. Nomenclature of higher categories

The classification of spiders included no named categories between family and suborder until THORELL (1886). Gradually the use of several intermediate categories became a common practice, although their nomenclature has not been stable. Since COMSTOCK (1913), the term superfamily has been repeatedly used, but KISHIDA (1930) was the first to regard it as the next category above family. The latter author also introduced into arachnology the suffix -idea for superfamily, but CAPORACCO (1938), GERHARDT & KÄSTNER (1938 – 1941), and BONNET (1959) have used the suffix -formia, in spite of the recommendation of the International Commission of Zoological Nomenclature.

In this paper, the suffix -idea as first proposed by VAN DUZEE (1916) is used for superfamilies, but no strict rules of priority have been applied to categories above the generic level. In single cases, decisions have been made with a view to attaining the greatest possible stability. However, the principle of stability is far more difficult to apply in arachnology than in most of the other groups of animals, as the limitation of families has not yet been stabilized.

It seems necessary to use an additional grouping between suborder and superfamily, but no special name for this taxon is proposed here, as it may be only a provisional unit. In order not to burden the already complicated nomenclature of spider classification with a new system of names, the suffix -ides is here used for this intermediate category, although my groups named in this way are by no means

identical with groups similarly named by several authors of the past.

In my opinion, the use of six intermediate categories between suborder and superfamily, as in BONNET (1959, p. 5038), is out of keeping with the deficient state of our knowledge of phylogenetic relations within this order.

The use of a named taxon between subfamily and genus is by no means necessary, but as the use of additional names is no burden on nomenclature at this level, the separation and even naming of tribes in large subfamilies with well-known phylogenetic relationships, is both practical and elucidating. In this paper tribes have been used sparingly in cases where it is a matter of opinion whether a group of genera does represent a clear-cut subfamily or not. It must be emphasized that any additional taxa that are here used conditionally, always refer to cases in which the monophyly is taken for granted.

In order to avoid the unnecessary introduction of names, to which all the regulations of the International Code for Zoological Nomenclature (1964) must be strictly applied, the category of subgenus is totally omitted here and, when it might be useful, replaced by species groups without nomenclatory status.

4. Main lines of evolution

The ancient Araneomorph stock was divided into several lines of evolution in the Palaeozoic era, and as Palaeozoic and especially Mesozoic fossils of spiders are few in number, the course of evolution in these main branches can be reconstructed only by simultaneous analysis of all single characters and by comparison of prevailing evolutionary trends. The results of the detailed analysis of the evolution of different characters are published elsewhere; the most important preliminary results only are discussed here.

A condition of the preliminary phylogenetic classification of the whole suborder Araneomorpha as compiled here has been that the following characters as such, or at a more primitive stage, have been present in the Palaeozoic ancestors of this suborder. Thus the list shows the most primitive pattern of recent Araneomorph spiders which has been observed up to date, but no attempt has been made to extrapolate the probable structural patterns of Palaeozoic spiders. However, the acquisition of direct information from most of these charac-

ters about these fossil spiders is practically impossible.

The primitive character patterns are here arranged topographically.

Cephalothorax: carapace pear-shaped; eyes in two rows (AM-AL & PM-PL); fovea longitudinal.

Abdomen: posterior pair of respiratory organs consists of book-lungs; anterior median pair of spinnerets modified to bipartite cribellum; cardiac ostiae reduced to four pairs; dorsoventral muscles reduced to four pairs; external epigyne absent.

Appendages: chelicerae without basolateral condyle (= cheliceral boss); labium not fused with sternum and without basal notches; pedipalpal coxae medially drawn to well-developed gnathocoxae (= maxillae); male palpal bulbus with tegulum, ejaculatory duct and embolus; tarsi of the walking legs with three claws and without scopulae; fourth metatarsus with calamistrum; trochanterae unnotched.

Hair covering: principal hair covering of plumose type; erect hairs of single type totally lacking. Cf. Figs. 8–10 on p. 286.

With some reservations, the following characters are added to the list of primitive characters:

Sternum with sigillae; feathery hairs present in the superficial hair covering; male bulbus originating terminally from cymbium; legs with dorsal spines in femora, and paired ventral spines in tibiae and metatarsi; tarsal trichobothria absent.

None of these primitive characters of Araneomorpha is available as a key-character. The majority have been radically modified in most of the evolutionary lines of this suborder, while the presence of well-developed maxillae is not entirely restricted to Araneomorpha.

Araneomorpha is best characterized by the pattern of spinnerets, because in cases where the cribellum has been reduced, the other spinnerets constitute a pattern typical of this suborder only. In a few aberrant cases (Hahniidae, Ammoxenidae, Prodidomidae, Mecysmauchenidae, Palpimanidae, Cryptothelidae) the pattern cannot, in any case, be confused with that of the other suborders. Moreover, all these aberrant groups belong to the vicinity of some other, typically Araneomorph families, according to numerous other phylogenetically significant patterns of characters, especially the complicated genital organs.

The results of my work deviate greatly from the previous schemata in broad outlines, as well as in numerous details. Therefore continual references to any previous classification are almost totally omitted in the discussion of the main lines of evolution. However, the most important alternatives are referred to later in this chapter.

Fig. 1 shows a rough simplification of the probable lines of evolution in the suborder

ARANEOMORPHA

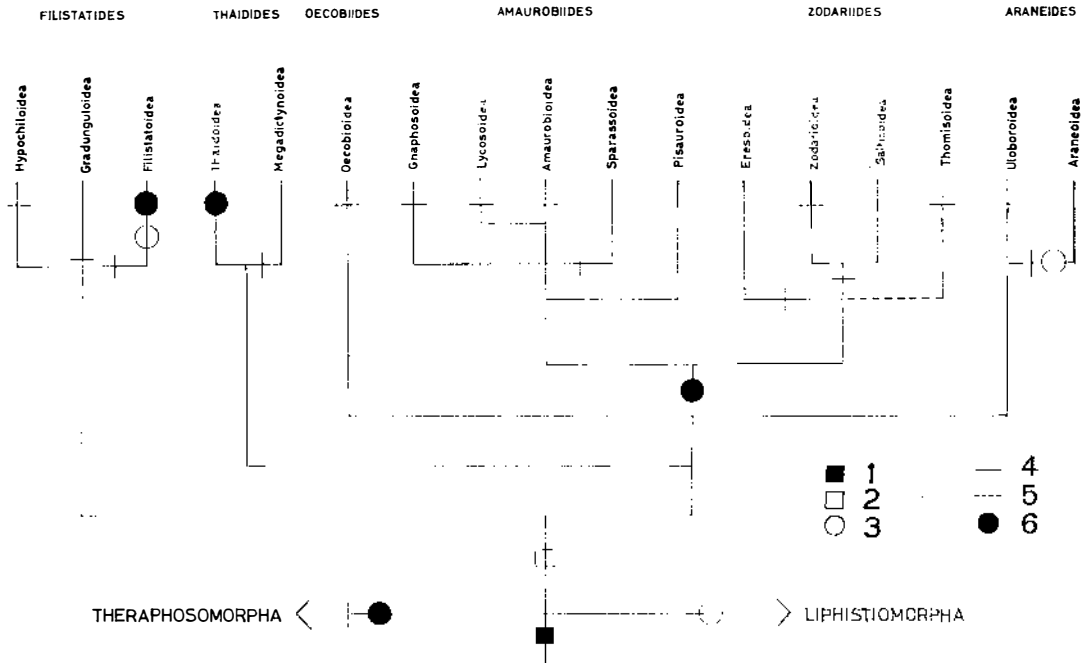


Fig. 1. Evolution of hair structure and patterns. - 1 = origin of plumose-laminar hairs, 2 = origin of feathery hairs, 3 = origin of simple-serrate erect hairs, 4 = reduction of feathery hairs, 5 = pseudoserrate hairs of the plumose type, 6 = origin of tarsal trichobothrial patterns.

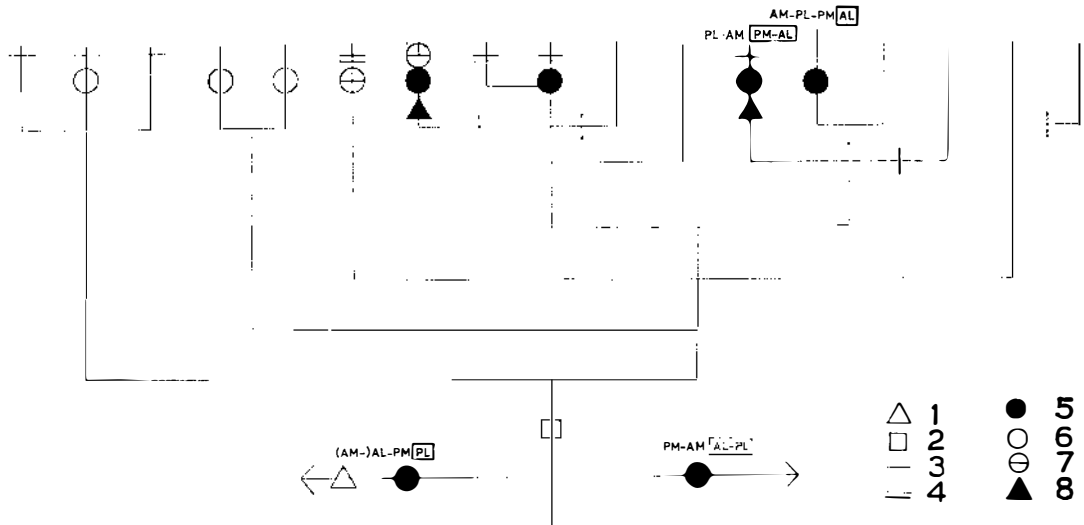


Fig. 2. Evolution of spinnerets. - 1 = direct reduction of anterior median spinnerets, 2 = modification of anterior median spinnerets to cribellum, 3 = functional reduction of cribellum to colulus, 4 = parallelism in the reduction of cribellum, 5 = modification in the pattern of spinnerets, 6 = modification in the structure of posterior lateral spinnerets, 7 = modification in the structure of anterior (and posterior) lateral spinnerets, 8 = modification in the structure of posterior median spinnerets. Capital letters indicate the order of partial or total reduction of spinnerets; the most reduced pattern in frames.

When the symbol is placed to the horizontal line, the character is common to all recent members of the branch. A symbol on the vertical line indicates that other alternatives are also present. Minor isolated groups of the main branches as well as most families with uncertain position have been omitted. The superfamily Thomisoidea is an exception.

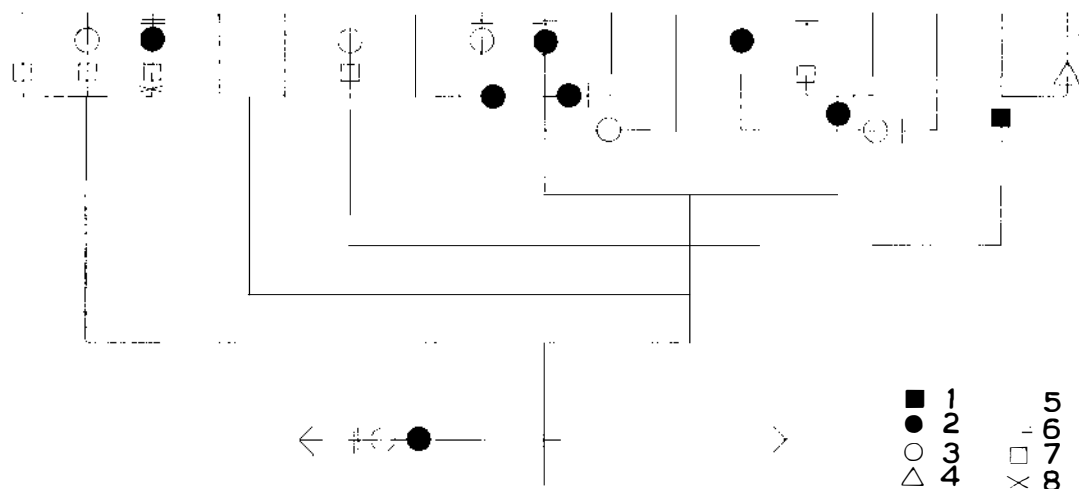


Fig. 3. Evolution of tarsal claws and spinning habits. - 1 = origin of the orb-web, 2 = reduction of web to different types of dwelling sack, 3 = adaptation to hunting habits with $\pm$ total reduction of web, 4 = adaptation to commensalism or robbery with reduction of the own web, 5 = reduction of the unpaired tarsal claw, 6 = parallelism in the reduction of tarsal claws, 7 = development of double row of teeth in paired tarsal claws, 8 = reduction of all tarsal claws (according to MELLO-LEITÃO 1946).

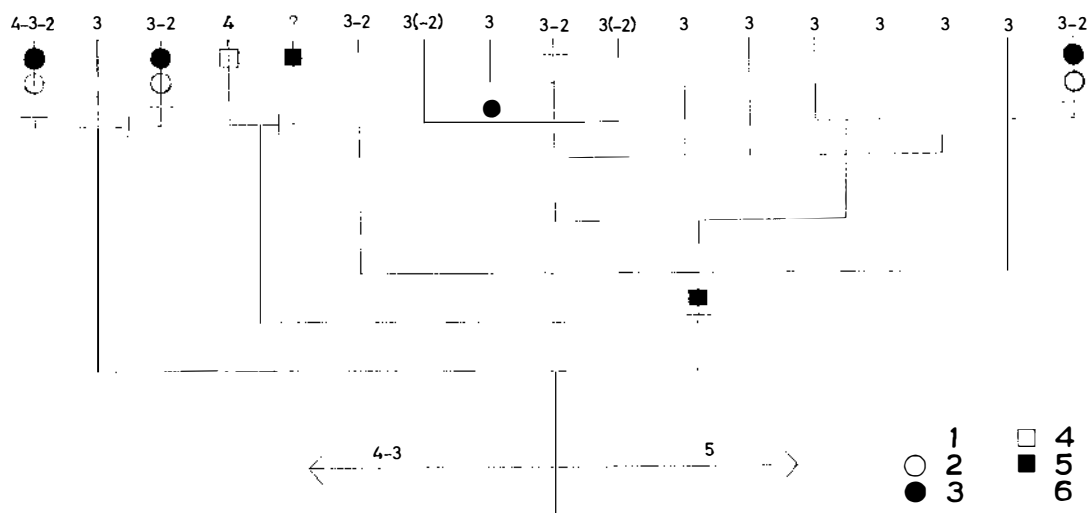


Fig. 4. Evolution of respiratory and circulatory organs. - 1 = modification of the posterior lung-books to tracheae, 2 = modification of the anterior lung-books to tracheae, 3 = total reduction of the posterior pair of respiratory organs, 4 = paired stigmata with large atria, 5 = fusion of stigmata to an unpaired organ, 6 = change of the position of stigma towards the genital furrow. The figures 4-3-2, etc., refer to number of cardiac ostia.

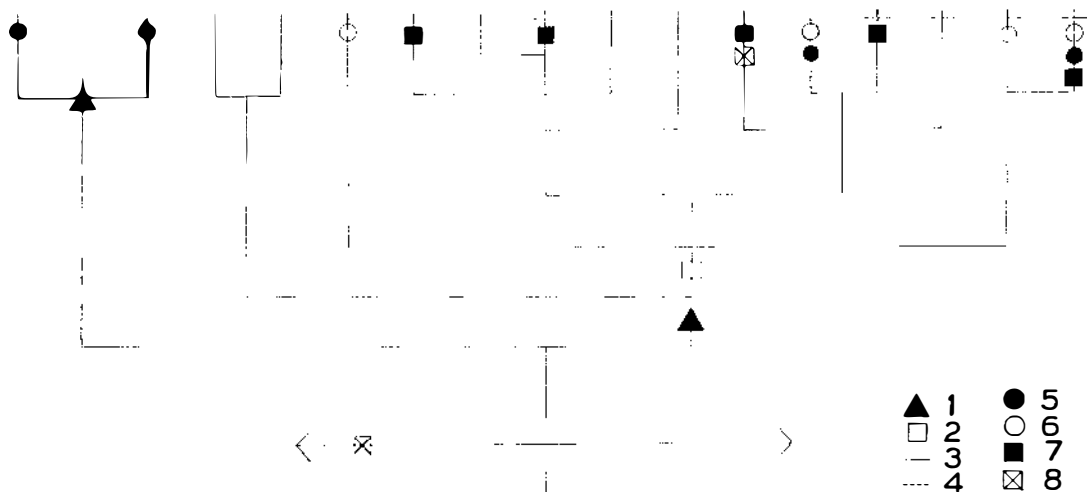


Fig. 5. Evolution of chelicerae. - 1 = origin of diaxial chelicerae, 2 = origin of the lateral cheliceral condyle (= cheliceral boss), 3 = secondary reduction of the cheliceral condyle, 4 = incomplete reduction of the cheliceral condyle, 5 = adaptation to sucking habits by fusion of the chelicerae, 6 = adaptation to sucking habits by rigidization of the chelicerae, 7 = development of sexual dimorphism of chelicerae, 8 = development of a cheliceral rastellum.

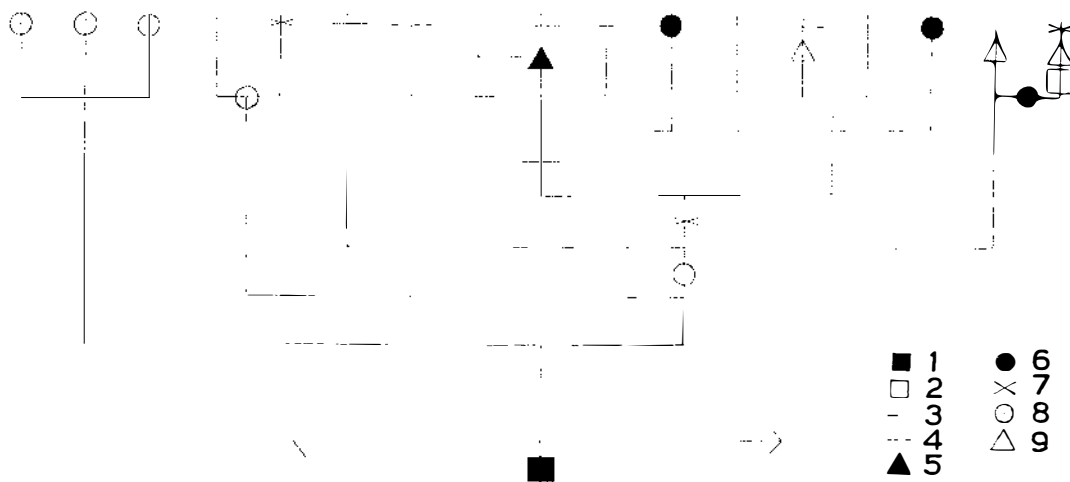


Fig. 6. Evolution of genital organs. - 1 = origin of embolus, conductor and tegulum, 2 = origin of the complex type of embolic division, 3 = origin of the median apophysis with movable joint at the base, 4 = secondary reduction of the median apophysis, 5 = origin of the membranous secondary conductor, 6 = origin of paracymbium, 7 = origin of tibial apophyses, 8 = development of sclerotized and sculptured types of epigyne, 9 = secondary reduction of the sculptured epigyne.

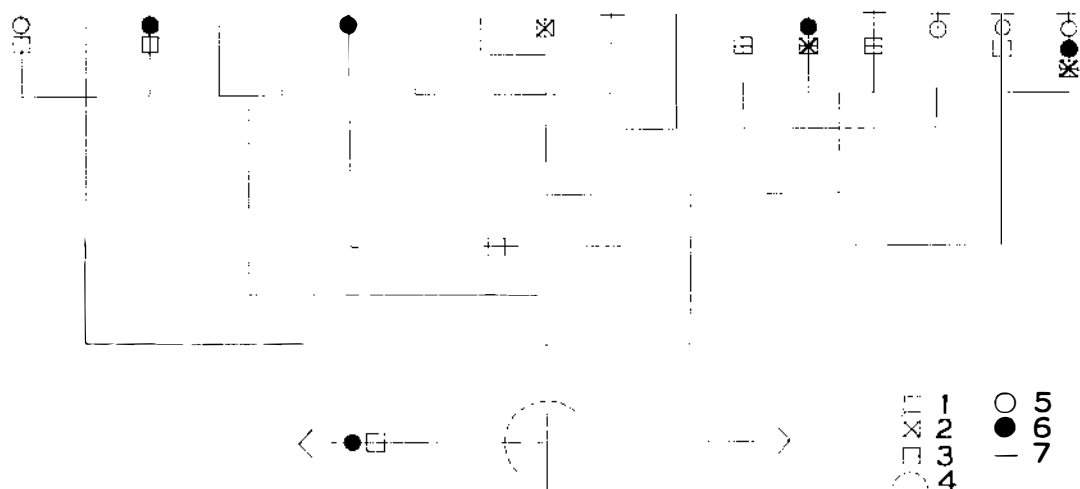


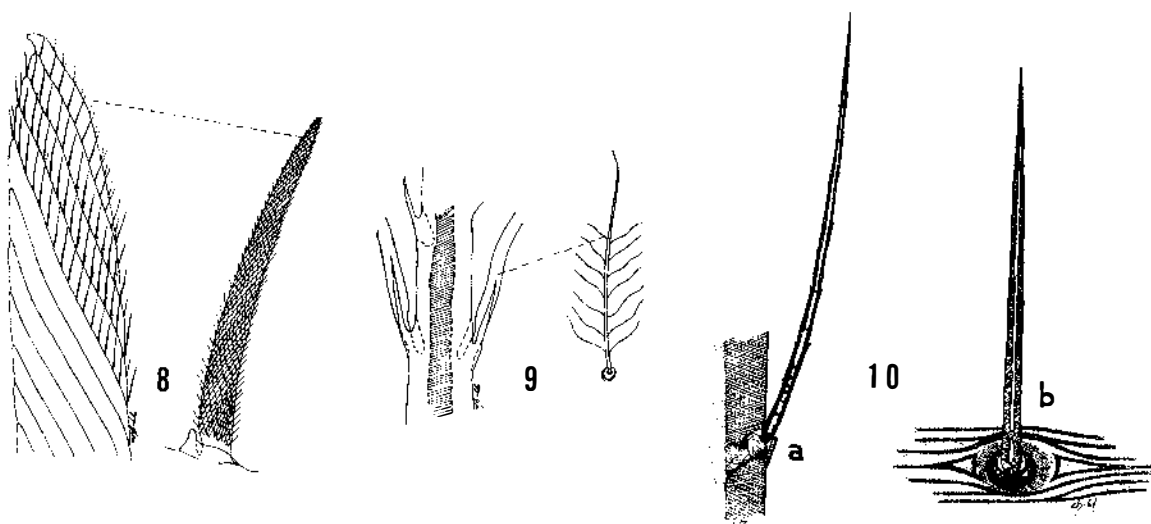
Fig. 7. Evolution of carapace and abdomen. — 1 = radical modifications in the shape of carapace, 2 = *Archaea* type modifications of carapace, 3 = modifications of carapace towards ant-mimicry, 4 = reduction of the external segmentation of abdomen, 5 = radical modifications in the shape of abdomen, 6 = development of abdominal scuta, 7 = development of bright green pigments.

Araneomorpha. It is evident that the resulting six groups will not remain equal after future investigations, but it is highly probable that each of them is monophyletic. For limitation of the superfamilies, see chapter V.

All data available on the evolution of different characters have been taken into account in

compilation of my schema, but I shall give a detailed analysis of this procedure in a later paper. Figures 1–7 present the evidence acquired from the study of the evolution of some of the most important structural patterns.

The branch Filistatides is here separated to represent the bulk of the families and genera



Figs. 8–10. Hair types of some representatives of the suborder Araneomorpha. — 8: Plumose-laminar (spine of *Arctella lapponica*), 9: feathery (hair from a leg of *Tegenaria domestica*), 10: simple-serrate, a) serrate hair from a leg of *Meta segmentata*, b) simple hair from the integument of *Linyphia triangularis*.

that are generally called Haplogynae, according to SIMON (1892 a). PETRUNKEVITCH (1933) scattered them into different groups in his horizontal classification, and he also supposed that the simple structure of the genital organs in this branch might be the result of secondary reduction. I cannot agree with him for two reasons. First, the general evolutionary trends among the different groupings of these spiders are remarkably parallel, including the reduction of posterior respiratory organs as well as that of plumose hairs and the unpaired tarsal claw. Then there is a general trend towards a very simple trichobothrial pattern of metatarsi and tarsi, independent of the size of the spider, and a trend towards cheliceral modification for sucking habits. On the other hand, it is not likely that the secondary reduction of both the male and female genital organs, suggested by PETRUNKEVITCH (*op. cit.*), would have resulted in the same primitive pattern in every separate line of evolution. Besides, this pattern is fundamentally the same in the suborder Theraphosomorpha. Thus it may be regarded as a conservative character with a very slow rate of evolution both in the branch Filistatides and in the latter suborder. Finally, my schema does not need any complicated patterns of convergence to explain it.

Altogether, the branch Filistatides is by no means a compact group, and perhaps it could be split up into several groups, taxonomically equal to, e.g., my Amaurobiides and Araneides. As to the habitus, evolution in this group has led to a correspondence between numerous basic types of Filistatides and most of the basic types of Entelegyne spiders; this is a pattern of convergent evolution in general appearance comparable to the well-known mammalian example Marsupialia – Placentalia.

The mutual phylogenetic relationships suggested in this paper for the families of Filistatides are not undisputable, at least in some cases; the alternative of lumping is preferred here for the sake of consistency in the monophyly of the units treated.

The spiders with the Haplogyne type of genital organs have often been regarded as a generally primitive group. A thorough survey of various representatives of this group proves that this hypothesis is not valid. Cf. also the complicated patterns of modifications of tarsal claws described by HICKMAN (1932) and FORSTER

(1955 b), stridulatory organs (MACHADO 1951, 1964), etc.

Some basic character patterns of Araneomorpha, however, are only found as such in Filistatides. They are posterior book-lungs, four pairs of cardiac ostia, and the sternal sigillae. Each is also quite rare among Filistatides.

The presence of a coupling spur in the first tibia of the male is a typical structure of the representatives of the suborder Theraphosomorpha, and a similar structure is also present in the genera *Plectreurys* (Plectreuridae) and *Ariadna* (Segestriidae). GERTSCH (1958 c) regarded this as mere convergence, and I am inclined to agree with him because of the simplicity of this structure. Besides, a functionally and structurally similar spur is present in the metatarsus of the males in some species of Amaurobiidae.

The remaining branches of Araneomorpha are more or less easily separable from Filistatides by the more complicated structure of the male genital organs, including the bulbus, which always originates subbasally from the cymbium, and usually consists of a well-separated tegulum and subtegulum, as well as a more or less distinctly limited embolus and conductor. However, some of these organs may be secondarily reduced in Entelegyne spiders (LEVI 1961), although additional sclerites or well developed processes are also often present.

The bulk of the representatives of the five remaining branches also have a more or less specialized external epigyne in females, although it may have become secondarily reduced (Tetragnathidae, Palpimanidae) without parallel reduction of male genital organs.

The presence of a well-developed epigyne and a fairly complicated palpal structure in Pholcidae misled SIMON (1892 a) to include this family in Entelegynae instead of Haplogynae. All other characters, however, prove close relationship between Hypochilidae and Pholcidae (cf. p. 301), and later it has been shown by MACHADO (1964) that there is also a series of intermediate types of epigynes in Ochyroceratidae.

An entirely new group, Thaidides, is proposed here for a few exceptional Cribellate species from Chile and New Zealand. They possibly represent the only living members of an ancient branch of evolution that constituted the ancestors of the last four branches, Oecobiides, Amaurobiides, Zodariides, and Araneides. The

Table 1. Principal groups of »Entelegyne» Aranemorph spiders.

	Oecobiides	Amaurobiides	Zodariides	Araneides
General evolutionary trends	flattening of the body; modification of the eye pattern and the spinneret pattern	adaptation to hunting habits; cheliceral adaptation to crushing of the prey; development of ventral trochanteral notch; complication of the hair pattern of legs	roughening of the chitinous surfaces and sclerotization of the abdomen; cheliceral adaptation to sucking of the prey with fusion of cheliceral teeth into chitinous keels; modification of the structure and pattern of spinnerets	simple-serrate hairs; modification of the shape of cephalothorax and abdomen; development of complicated pattern of male and female genital organs
Conservative characters	structure of the male and female genital organs; feathery hairs	shape of abdomen and cephalothorax; plumose hairs without distinct modifications; lateral cheliceral condyle	pattern of male genital organs (in some lineages, at least)	structure and pattern of spinnerets; tarsal claws; web-spinning habits
Patterns of sexual dimorphism	insignificant	length of legs, size and colouration (cheliceral structure, shape of maxillae, length of spinnerets, spine pattern, etc.)	size, abdominal colouration, reduction of female spinulation; modifications of the first pair of leg	size, excessive modification of the male carapace, sclerotization of abdomen, length of legs
Characteristics of some patterns of single characters				
– male genital organs	tegular organs small in relation to tegulum; no tibial apophyses	lateroapical tibial apophyses; median apophysis with flexible joint; membranous secondary conductor (not in all main branches)	no median apophysis in most species	paracymbium and terminal apophysis; basal part of embolus with complicated pattern of modification
– female genital organs	epigynal area transversally furrowed	tinges of brown and yellow	sclerotization of the whole epigynal area	epigynal clavus
– scale of abdominal pigments	brown to greenish yellow		tinges of brown, orange, and red; bright colours common in some groups	bright colouration common
– abdominal colour pattern	with anterior lancet-shaped figure	<i>Tegenaria-Pardosa</i> type	rows or large white or bright spots or very complicated	variable, often complicated
– metatarsal trichobothrial pattern	a few apical	complicated	apical	usually a single one
– tarsal trichobothrial pattern	variable	basic pattern one row of increasing length;	one row of equal length	none
Web structure	irregular sheet	several adaptive modifications sheet + tube	reduced to dwelling sack	orb web – modified regular webs
Habitats	mainly soil-inhabiting	soil-inhabiting – lapidicolous	very variable	vegetation

most striking characteristics of this group are the presence of a simple, weakly sclerotized epigynal tongue, lack of cheliceral condyle, irregularity of the spine pattern of the legs, and deviating structure of the posterior spinnerets. For a more detailed description of the two genera included, *Thaida* and *Megadictyna*, see p. 299.

Representatives of Oecobiides, Amaurobiides, Zodariides, and Araneides constitute the bulk of the spider fauna of the temperate and cold regions of the world. These four branches together are also almost identical with the Entelegynae of SIMON (1892 a), if corresponding Cribellate groups are excluded. For Pholcidae, see above.

The groups are not all equal as regards the

degree of the mutual relationship of groups included in them. The branch Araneides can be separated from the others by numerous key-characters. Amaurobiides and Zodariides seem to be much more closely related to each other than to any other branch, but the placing of whole families is generally easy because of largely different evolutionary trends. In spite of these facts, representatives of both the groups have repeatedly been confused with each other. Cf. also ROTH (1964).

Table 1 summarizes the most important characteristics and trends of the four groups mentioned above. They are not at all suitable as key-characters, but they demonstrate the most common patterns of structure and habit in the corresponding branches.

5. Taxonomic changes above the superfamily level

Besides being a general revision of the Cribellates and their close derivatives, the present study has revealed several strictly polyphyletic groups among the classical families. They are only briefly discussed here, because no results of their complete revision are available. However, a preliminary summary of these changes is necessary, as the characteristics presented in Figs. 1–7 for the main branches of Araneomorph evolution are not valid for corresponding sets of families when these are defined and limited as by all the previous authors.

Although there have been fundamental changes in the definition and limitation of most of the Cribellate families and «Agelenidae», these are not discussed in this chapter. For a detailed discussion of them, see chapter V.

Changes in the six main branches concern the limitation of classical Archaeidae, Clubionidae, and Toxopidae, as well as the placing of Bradystichidae, Hadrotarsidae, and Homalonychidae without relimitation of the families themselves.

«Archaeidae»

Since SIMON (1883 b, 1884 c, 1895 a) the family Archaeidae has been considered to include the genera *Archaea*, *Landana*, and *Mecysmauchenius*. In recent times, WILTON (1946) and FORSTER (1955 c) have described three additional genera, *Zearchaea*, *Holarchaea*, and *Pararchaea*. By original description, the genus *Mecysmauchenius* was placed in a different group that was later considered as a subfamily by PETRUNKEVITCH (1928), while the other genera have always been included in Archaeidae: Archaeinae. The separation has usually been done with the number of eyes as a key-character. On the other hand, the family Archaeidae has always been characterized by the cephalic area, which is excessively raised, and by the excessive lengthening of the chelicerae. These two characters, however, are strongly correlated, and this combination has been developed also, e.g., in the male of *Archaeodictyna anguiniceps* and, to a lesser extent, in several other Dictynid species.

As pointed out already by PETRUNKEVITCH (1939 b), the genus *Landana* deviates from the

recent species of *Archaea* by having spinose legs, posterior tracheae, an entirely different armature of the chelicerae, and an entirely different type of genital organs. Therefore, I cannot understand the conclusion of his revisional work (PETRUNKEVITCH 1939 b), in which *Landana* was left in Archaeidae. At least *Landana cygnea*, as studied by myself, is a typical Araneid genus with its colour pattern, cheliceral armature and, especially, its genital organs of the Araneid type (cf. also PETRUNKEVITCH 1939 b, Fig. 5). It is possible that the generotype of *Landana*, *L. petiti* Sim. 1884 from the Ethiopian region, belongs to a different genus than the Neotropical species discussed above, but probably it is an Araneid species, too. The Australian species, *Landana lautiuscula* Dalmas 1917, and the Chilean *L. edwardsi* Sim. 1904, were excluded from Archaeidae with some hesitation by PETRUNKEVITCH (*op. cit.*).

Most probably *Archaea godfreyi* Hewitt 1919 is congeneric with *Eriauchenus workmanni* O. P.-Cambr. 1881. Since SIMON (1895 a), the latter species has usually been listed in the genus *Archaea*, but in my opinion the type genus of this family includes only fossil species, and probably even they must be assigned to at least two different genera.

The information about the habits of *Eriauchenus workmanni* and «*Archaea vadoni*» given by MILLOT (1948), LEGENDRE (1959 b, 1961), and MILLOT & LEGENDRE (1964) distinctly shows that the true Archaeids ethologically resemble more closely the Mimetids, while the representatives of *Landana* are known as builders of orb-webs (SIMON 1895 a, PETRUNKEVITCH 1939 b). Cf. also the conclusions of KASTON (1965).

I have personally examined material of *Eriauchenus workmanni* from Madagascar, and I found no similarities between this species and *Landana cygnea*, or between it and *Mecysmauchenius segmentatus*, except the modification of carapace and chelicerae discussed above. On the contrary, the microstructure of the hairs, absence of spines and posterior stigma, armature of chelicerae, and the structure of genital organs are unique in *Eriauchenus*. However, there is no longer any doubt that the relimited family Archaeidae should be included in the superfamily Araneoidea, although its relationship to the other families is not finally cleared up. The Australian genus *Holarchaea* may also belong to this family. The presence of true Archaeids in Australia has been confirmed by my-

self through examination of type material of «*Archaea*» *nodosa* Forster 1955 (♀ Brisbane).

Concerning the remaining genera, I have personally investigated only material of *Mecysmauchenius segmentatus* Sim. 1884, but the excellent description and figures of *Zearchaea* and *Pararchaea* by FORSTER (1955 c) make it possible to discuss their taxonomic position without examination of the corresponding material.

These three genera are similar in general appearance, and their patterns of hair covering, genital structure, spinnerets, and abdominal colouration are distinctly related. Thus the presence of only six eyes in *Mecysmauchenius* does not warrant the provision of a different subfamily for the latter genus.

This group can confidently be transferred to the branch Zodariides. In this group the standards for families and subfamilies have not yet been stabilized, and because of several exceptional trends within this branch, standards applied to, e.g., Amaurobiides and Araneides, cannot be used in it. Thus the above group from «*Archaeidae*» is preliminarily referred to as the family Mecysmaucheniiidae. It seems to be related to Palpimanidae, and possibly also to the genus *Plectophanes*.

The most practical key character for the comparison of Mecysmaucheniiidae and Archaeidae is the presence of plumose-lamellar hairs, which are totally lacking in the well-known superfamily Araneoidea. For the evolution of the pattern of spinnerets, cf. Fig. 2.

«Clubionidae»

After the examination of a large number of species of this well-known and world-wide family, it is evident that it is a mere assemblage of two-clawed Araneomorph spiders without radical modifications in the basic shape of both abdomen and cephalothorax, or in the pattern of spinnerets. Besides, several genera included in this family do not even conform to these criteria. PETRUNKEVITCH (1923, p. 176) established the widely accepted limitation of Clubionidae, in separating Anyphaenidae, Sparassidae, and Ctenidae from the Clubionidae sensu lato of SIMON (1897). The final revision of the «Clubionidae» will be a work of several years, and the following preliminary notes are given here only to explain later references to the revised status of Clubionidae, Corinnidae, Liocranidae, Miturgidae, and Prodidomidae.

The species of «Clubionidae» will be distributed between the main branches Amaurobiides and Zodariides as follows below. It must be especially emphasized here that the classical subfamilial names Liocraninae, Clubioninae, Corinninae, and Micariinae are not used here with reference to limitations listed by ROEWER (1954 a) and BONNET (1959), but rather to series of related species grouped around the type species of the type genera of corresponding subfamilies.

Liocraninae is here raised to family rank and assigned to the superfamily Amaurobioidea as a close relative of Amaurobiidae and Miturgidae.

A final revision of Liocranidae cannot be presented here, but most of the Holarctic genera that have generally been assigned to Clubionidae: Liocraninae, Liocraneae, seem to belong there. The position of *Agroeca*, *Apostenus*, *Mesiotelus*, and *Scotina* as close relatives of the type genus *Liocranum* has been finally checked.

CROME (1955 b, p. 609) observed the similarity of abdominal pattern between *Liocranum* and *Tegenaria*, but he did not use this fact as an evidence for phyletic relationship (cf. Figs. 42 – 57).

The most useful key character of Liocranidae is the presence of a secondary conductor in the male palpus, when comparisons are made with other genera of Clubionidae auct. For additional characteristics of this new family, see Table 8 on p. 310.

The other groups of Liocraninae auct. are neither related to my Liocranidae nor to each other. PETRUNKEVITCH (1928) used the shape of maxillae and the length of labium as key characters for his Clubionid subfamilies, while most other authors have not troubled themselves with the argumentation of such a classification, and thus it is easy to understand why the monophylety of their Clubionidae has never been doubted.

Most of the genera in ROEWER's (1954 a, pp. 555 – 559) Miturgeae are here included in the new family Miturgidae which also comprises several Cribellate genera. For detailed argumentation, see p. 315. Besides, many representatives of Clubioninae auct. also belong to Miturgidae, which is mainly characterized by large size and several kinds of modifications of spinnerets.

A large number of genera are generally known to be closely related to the classical European *Micaria* and *Phrurolithus*, but during this century they have never been included in a common

subfamily, although their general appearance is very similar and, in fact, their separation in the field is difficult for a less trained arachnologist. SIMON (1897, p. 23) separated his Liocraninae (with *Phrurolithus*) from Micariinae according to the shape of the apical segment of posterior spinnerets, and this key character has been later accepted by other authors, e.g., TULLGREN (1945). JACKSON (1932) transferred *Micaria* into Gnaphosidae, and LOCKET & MILLIDGE (1951) agreed with this opinion, while all these authors included *Phrurolithus* in Clubionidae.

In my opinion, the relationship of *Phrurolithus* and *Micaria* is evident, and the slight difference in the structure of posterior spinnerets is not sufficient to separate different subfamilies, as most of their characters largely agree. The subfamily Micariinae is here included in Gnaphosidae, although it might be regarded as an independent family as well. Then the classical key character of Gnaphosidae, long and cylindrical anterior spinnerets, could still be used.

The superfamily Gnaphosoidea is characterized here by the general trend towards modification of the structure and pattern of the spinnerets. The genus *Rhaeboctests* from Clubionidae: Liocraniinae must be transferred to Gnaphosidae: Anagraphinae, where it seems to be closely related to the genus *Theuma* according to general appearance, exceptional shape of median spinnerets, and genital organs of both sexes.

The genera *Honunius*, *Molycrria*, and *Myandra* do not conform to any standards of definition of the family Clubionidae. However, they have always been listed there, usually in Micariinae: Molycrriae (e.g., ROEWER 1954 a). SIMON (1897) proposed a subfamily Myandrinae, and DALMAS (1919) a corresponding subfamily Molycrriinae for this group, but both of these were also assigned to Clubionidae. Indeed, DALMAS (*op. cit.*, p. 279) emphasized the similarities of the eye pattern and spinnerets in representatives of Molycrriinae and Prodidomidae. Besides, it is interesting to note that the genus *Cryptoerithus* Rainbow 1915, with which I am not personally acquainted, was originally described in Prodidomidae, but later transferred to Clubionidae: Molycrriinae by DALMAS (*op. cit.*, p. 261).

Having seen representatives of *Honunius*, *Myandra*, and *Molycrria*, and compared them with *Zimiris*, *Zimirina*, and *Eleleis*, I am convinced of the phylogenetic relationship of these

groups of genera. Their only widely deviating character is found in the modification of the chelicerae, which is far more extreme in *Zimiris* and related genera when these are compared with the basic pattern of Zodarioidea, to which the structure of chelicerae in *Myandra* and related genera largely corresponds.

I prefer to consider Myandrinae as a subfamily of Prodidomidae, and list this group in Gnaphosoidea. COOKE (1964) did not discuss the relationship of Prodidomidae and Myandriidae in his revisional study of Prodidomidae, nor was the position of this family defined by him.

The limitation of the true Clubionidae, that is, the nominal subfamily of classical Clubionidae, is not quite clear to me, as there are only two well-known Palearctic genera that could be included in it, viz. *Clubiona* and *Chiracanthium*. Both have a wide total range when limited according to the standards derived from SIMON (1897). LOHMANDER (1944) first presented a subgeneric division for the European groups of species generally included in *Clubiona*, but his paper seems to have been neglected by WIEHLE (1965) in his revisional work on the European species. Most probably some of these groups must be called separate genera, since their phylogeny has been cleared up, and the exotic species have been revised as well. A revisional study of the very large genus *Chiracanthium* has not been presented since L. KOCH (1864). However, many of the species from New Zealand and Polynesia described under the generic name *Chiracanthium* are really three-clawed spiders, and some of them were transferred to the genus *Huara* by FORSTER (1964 a). He assigned this genus to Agelenidae, but here it has been transferred to Amaurobiidae.

The genera or «supergenera» *Clubiona* and *Chiracanthium* are not distinctly related to each other. For instance, there is a distinct trochanteral notch in *Chiracanthium*, and the structure of the male genitalia at least is largely divergent. Although there is a general trend towards the development of a trochanteral notch in Amaurobiides, it is not a rare structure in Zodariides, and it is also present in different lines of evolution in this main branch, e.g., *Castianeira* and *Lachesana*. Thus, the position of my Clubionidae cannot be confirmed according to trochanteral structure.

Very little can be said now about the other possible representatives of the family Clubioni-

dae as it is delimited here. Of the genera that have been personally investigated by me, *Mati-dia*, *Marcellina*, *Neonanagraphis*, and *Thysanina* might belong here.

My Clubionidae is evidently related to Sparassidae, and here the superfamily name Sparassoidea is preferred to Clubionoidea for several reasons. Above all, the name Clubionoidea has been earlier used in a radically different sense (BRISTOWE 1938, p. 319; PETRUNKEVITCH 1958, p. 99). On the other hand, my Clubionidae is a small family when compared with the large and world-wide Sparassidae. For characteristics of Sparassoidea, see p. 384.

The remaining «Clubionid» groups are listed here in different superfamilies of the branch Zodariides, and the trends within each of these groups conform well to the general characteristics of Zodariides as presented in Table 1.

The large and world-wide subfamily Corinninae, as limited by PETRUNKEVITCH (1928) and later, is obviously a monophyletic group. It is characterized by the lack of distinct tarsal trichobothria, a strong trend towards sclerotization of the abdomen and especially of the epigynal area. The colulus is also well sclerotized, more or less triangular, and never bipartite as in true Clubionids. The male palpal tegulum usually tapers gradually towards the embolus, and the ejaculatory duct is more or less coiled within the proximal part of the embolus. The maxillae are also commonly of Zodarid type, that is, without lateral excavations, but with medially tapering apex. As this group is here far removed from Clubionidae, it must be raised to family rank. The oldest available name for this family would be Myrmecidae, as C. L. KOCH (1851) created the family Myrmecioidea for some genera with a striking tendency to ant mimicry. However, the rules of priority are fortunately not absolute with regard to families, and thus the name Corinnidae, as first used by KARSCH (1880), is preferred here, because the genus *Corinna* is a typical representative of this family.

In addition to the species that have commonly been referred to Clubionidae: Corinninae, scattered groups of other subfamilies of «Clubionidae» belong to this easily-characterized family. According to the material that has so far been investigated by myself, the following species and genera must be transferred to Corinnidae, but there are certainly numerous additional species.

Among Micariinae: Micariac as limited by ROEWER (1954 a, p. 607–636), *Myrmecium*, *Myrmecotypus*, *Sphecotypus*, and most of, but obviously not all, the Neotropical and Ethiopian species of «*Castianeira*» are typical representatives of Corinnidae, when the modifications towards ant mimicry have been excluded.

The genus *Sphingius* from Micariinae: Molycriae may be related to *Cycais cylindrata* Thor. 1877, which was originally described in Agelenidae and later generally listed there, too, except by THORELL (1890), who created the family Cycaidae. I have not personally examined material of *Cycais*, but most probably it belongs to Corinnidae as certainly does *Sphingius*.

Orthobula crucifera Bösenb. & Strand 1906 has always been listed in Clubionidae: Liocraninae, although it is a typical Corinnid species.

The subfamily Cybaeodinae that was included in Gnaphosidae by SIMON (1893 a) and provisionally in Clubionidae by PETRUNKEVITCH (1923) obviously belongs to Zodarioidea, too. The genera *Andromma* and *Cybaeodes* are evidently related to each other, while the Neotropical genus *Baeriella* may belong to Corinnidae.

It is worth emphasizing here that feathery hairs are totally lacking in all known evolutionary lines of Zodariides, although their ancestors probably had this type of hairs, too.

The genus *Carteronius* from Madagascar is quite exceptional in regard to genital structure, colour pattern, and chelicerae, but now it can only be stated that this genus is hardly akin to any of the groups of «Clubionidae» that have been discussed above.

«Toxopidae»

In creating the new family Toxopidae, HICKMAN (1940) was not able to place it accurately. ROEWER (1954 a, p. 99) listed it between Ageleidae and Hahniidae, and I agree with him about its affinity with Hahniidae in spite of there being several special characters peculiar to Toxopidae only. These are the eye pattern, and the well-developed auxiliary tarsal claws. The male palpal organs of *Toxops* largely resemble those of *Tuberta*, including the enormous folded conductor and the lack of median apophysis.

The problem of the phylogeny and limitation of Toxopidae has become much more complicated since the revision of this family by FORSTER

(1964 b). I have not examined any material of *Toxopsiella* or *Laestrygones*, but FORSTER's paper is provided with the most complete descriptions and numerous good illustrations. When these have been compared with material of *Toxops*, *Plectophanes*, and *Cycloctenus*, and the information derived from the extensive analysis of the evolution of different characters has been critically applied to this case, it is obvious that none of the genera mentioned above can be grouped together with *Toxops*. The basic pattern of the male genital organs seems to be quite different in each of these genera, with well-developed median apophysis, and probably also a secondary conductor in *Toxopsiella*. The eye pattern of *Cycloctenus* refers to Ctenidae, in which it was catalogued before FORSTER (*op. cit.*). The general habitus of each of these genera also deviates decidedly from that of *Toxops*.

For *Galliena*, see p. 374.

The taxonomic history of all «Toxopids» other than the type genus is full of vicissitudes (FORSTER 1955 a, 1964 b), but this is especially true of *Laestrygones* and *Plectophanes*. I cannot even agree with FORSTER (1964 b). These two genera are here transferred to Zodariidae. *Plectophanes* may be related to Mecysmauchenidae, while *Laestrygones* cannot be placed exactly. However, the chitinous plate in front of the spinnerets and the highly modified eye pattern refer to the superfamily Zodarioidea.

The limitation of the small families Bradystichidae, Hadrotarsidae, and Homalonychidae has been correct since they were first described, but their position in the spider classification needs some comments here, as all of them have usually been grouped together with families which in fact are not at all related to them.

Bradystichidae

SIMON (1880 c) separated Bradystichidae as a family of its own and later (SIMON 1892 a, p. 61) placed it between Argiopidae and Thomisidae. At last he (SIMON 1898 a, p. 363) included it in Lycosidae as a subfamily. No one has since paid any attention to this group in connection with spider classification, and the compilers of catalogues have only copied the latter opinion of SIMON. Investigation of female specimens of *Bradystichus calligaster* Sim. 1884 and *B. crispatus* Sim. 1884, both from New Caledonia, re-

vealed that they can be included neither in the superfamily Lycosoidea nor in Amaurobiidae at all. The family Bradystichidae is characterized by a strongly modified abdomen and cephalothorax, and their habitus resembles that of Cryptothelids because of the rugose integument with numerous small particles attached to its surface. Unfortunately, mature male specimens of this family have never been found, and it cannot be finally decided by female characters only whether it must be transferred to Zodarioidea or to Thomisoidea. All data available until now are in favour of Zodarioidea, e.g., the pattern of spinnerets, shape and armature of chelicerae, and the female genital organs. The strongly bulging lateral eyes, however, are more commonly found in Thomisidae.

Hadrotarsidae

Representatives of this family have been extremely rare and little has been known about them until recent times. No specimens were available for SIMON (1892 a, 1893 a), when he placed this family between Oonopidae and Caponiidae in his section Haplogynae. After that, *Hadrotarsus* and *Gmogala*, both represented in European collections by a single specimen, were included either in Oonopidae (POCOK 1903 and GERHARDT & KÄSTNER 1938 - 1941), or in Theridiidae (L. BERLAND 1932).

In recent times, additional species of the genus *Hadrotarsus* have been described by HICKMAN (1943) from Tasmania and southern Australia and by WANG (1955) from Taiwan. The external and internal anatomy of *Hadrotarsus* has been described in detail by HICKMAN (*op. cit.*), and he also presented a new definition of the family compatible with modern standards of arachnology. Besides, HOMANN (1952) investigated the histological eye structure of *H. ornatus*, and stated that it resembles Theridiidae more than Oonopidae in this respect.

I have examined the male holotype of *H. babirusa* Thor. 1881 from New Guinea, that is, the type of the family, the holotype of *Gmogala scarabaeus* Keys. 1889, as well as paratypes of *H. ornatus* Hickm. 1943 from Tasmania. In addition to the characters described by HICKMAN (*op. cit.*), the presence of the plumose-lamellar type of hairs and the absence of both single and feathery hairs, were secured for this family. In spite of some resemblance to Gamasomorphinae and Textricellinae, on account of

the strongly chitinous dorsal scutum of the abdomen, there is hardly any other character that is similar to those of Oonopidae or Symphytognathidae.

Altogether, Hadrotarsidae constitute a largely divergent type of spiders, which might belong either to Oecobiides or to Zodariides, or even constitute a main branch of its own, but its phylogenetic relationship to any »Haplogyne» families or to the branch Araneides is proved here to be impossible. Hadrotarsidae is provisionally listed in Oecobiides.

Homalonychidae

Opinions about the position of this purely Nearctic family have varied. Sometimes it has been placed close to Gnaphosidae (PETRUNKEVITCH 1933 and BRISTOWE 1938), sometimes in a separate superfamily Homalonychiformia together with Cithaeronidae (CAPORIACCO 1938, GERHARDT & KÄSTNER 1938 – 1941), and even close to Sicariidae by PETRUNKEVITCH (1923, p. 163).

Examination of material of both sexes of

Homalonychus theologus Chamb. 1924 makes it clear that this family must be assigned to Amaurobiides. According to the eye pattern, presence of feathery hairs, notched trochanterae, and basic pattern of male and female genital organs, it seems to be related to Oxyopidae and Pisauridae, and thus it is listed here in the superfamily Pisauroidae.

Pholcidae

Although this family has been correctly placed among the »Haplogyne» families by several authors of this century, others have followed SIMON (1892 a, 1893 a) and GERHARDT & KÄSTNER (1938 – 1941) in placing it among the Entelegynae as a superfamily of its own. Pholcidae is here listed in Hypochiloidea and its affinities are discussed in more detail on p. 300.

Other families with very variable placing in different classifications of this century are Cithaeronidae, Caponiidae, Senoculidae, and Ammoxenidae. They are shortly discussed in Chapt. V.

V. Phylogenetic classification of Cribellata and their derivatives

Each of the main branches of Araneomorpha includes at least some Cribellate families. Thus the phylogenetic classification of all of them is discussed in this chapter. However, the investigation of details has been confined to those subdivisions in which recent Cribellate spiders exist.

1. Explanation of tables and terms used

Contrary to common practice, the characteristics of the genera, subfamilies and families have been presented by means of comparative tables. These tables may serve as normal descriptions, keys, and comparisons of related taxa, as required by the principles of modern taxonomy.

This concise method of description is especially practical in comparative studies, its only drawback being that it makes necessary the use of numerous abbreviations. In the tables in this paper, abbreviations in general use have been preferred whenever possible, and they are all listed below.

Size classes

The range of variation has been indicated without any attempt to demonstrate the exact curve of variation. However, when the average size of the taxon described is closer to either of the extreme size classes mentioned, that is listed first. To take an example: if the species of a genus are minute, small, medium sized, or large, but most of them are medium sized or large, then the variation in size has been expressed as large – minute. On the other hand, when most of the species are small, but the same size classes occur, then the variation in size has been expressed as minute – large.

Although measurement of the length of the cephalothorax or some other continuous sclerotized structure is the only valid method of indicating the size of a spider in quantitative analysis (cf. COOKE 1965), I have here preferred to take the total length of the body, that is the length measured from the front margin of the clypeus to the base of the posterior spinnerets. As an argument for such a choice in this kind of extensive comparative study, it may be mentioned that most of the information available in older literature has been given in a similar way, and that when investigating type material in European museums I had to use the restricted time available for detailed analysis of characters that had not been very well described. In my opinion, this way of indicating size is accurate enough for the present revision of categories higher than species.

In the size classes used, total lengths are as follows:

minute	< 2 mm
small	2 – 4 mm
medium	4 – 8 mm
large	8 – 16 mm
very large	> 16 mm

Basic pattern

The simple abbreviation BP has been used when the character concerned shows no modification of the basic pattern of the group. This practice has been especially useful in the superfamily Amaurobioidea, where the basic pattern of several characters is exceptionally stable throughout this large group. In some cases the basic pattern refers to smaller units, but then the use of this abbreviation has been regarded as self-evident.

Other general abbreviations are:

bas.	basal, basally	modif.	modified
apic.	apical, apically	complic.	complicated
lat.	lateral, laterally	red.	reduced
abd.	abdomen, abdominal	trapez.	trapezoidal
ant.	anterior, anteriorly	rectang.	rectangular
post.	posterior, posteriorly	triang.	triangular
v. or ventr.	ventral, ventrally	quadr.	quadrangular
d. or dors.	dorsal, dorsally	s. or segm.	segment
caud.	caudal, caudally	cyl.	cylindrical
rec.	recurved	proc.	process
proc.	procurved	apoph.	apophysis

A comment in parentheses indicates an exceptional case. When alternatives are given, the former is the more common, except in the case of numerals, where the variation has been indicated in parentheses, or by some other means.

A question mark refers to cases in which there is no reliable information available, although material has actually been collected and sometimes described. On the other hand, the lack of one sex or of adult specimens in general among the material described, has been clearly stated.

Spinnerets

As regards cribellum and colulus, the occurrence of either or both has generally been indicated by the self-explanatory abbreviations cr (cribellum) and co (colulus). When either of these homologues is quite exceptionally present in the corresponding taxon, the abbreviation has been put into parentheses.

When abbreviated, the spinnerets proper are indicated as follows:

AS	anterior (lateral) spinnerets
MS	(posterior) median spinnerets
PS	posterior (lateral) spinnerets

Ocular pattern

AM	anterior median eyes
AL	anterior lateral eyes
PM	posterior median eyes
PL	posterior lateral eyes
MOT	median ocular trapezium (refers to mutual position of AM & PM)
LOT	lateral ocular trapezium (refers to mutual position of AL & PL)

Legs

fem.	femur, femoral
tib.	tibia, tibial
mt.	metatarsus, metatarsal
t.	tarsus, tarsal
sp.	spine, spines
trichob.	trichobothrium, trichobothrial
scop.	scopula

Male palpi (♂-p)

emb.	embolus
cond.	conductor
teg.	tegulum, tegular
med. apoph.	median apophysis; in Amaurobiides and Zodariides it always refers to an apophysis that is attached to the tegulum by a flexible membrane
cten.	ctenidium; refers to separate tooth in palpal tibia or patella

Female genitalia

epigyne	(♀-e) refers to external chitinous structures
– vulva	refers to internal chitinous structures

Special characters

These lines refer to exceptional modification of the taxon concerned, whether this character is available as a key character for this taxon or not.

Distribution

The total range of a taxon has been presented when possible in terms of the major zoogeographical regions of the world. The name of any of these regions, without additional explanatory notes, indicates that the taxon is distributed practically all over it. On the other hand, the term world-wide has been applied even when the taxon is distributed over considerable areas of each of the regions, although not even over half of the total area of some of them.

The following restrictions are also worthy of note. The lack of representatives of a taxon in Arctic, Subarctic, and Subantarctic areas is not always mentioned, especially when this is a generally known fact. Those species whose position in the genus to which they have been assigned is dubious, are omitted in determining the range of the genus and of all higher categories. Most of these cases refer to species for which no material has been available. When the presence of strictly synanthropic species has considerably altered the total range of a taxon, this fact has been especially mentioned.

2. Primitive Cribellata

Two of the most primitive main branches of Araneomorpha are here treated together, for the number of species in the second one is very small, and it has always been included in the family Hypochilidae.

The phylogenetic relationships within Filista-

tides are more difficult to trace than those within the other four, «Entelegyne» branches. Thus the relationships presented here are rather speculative in many details, except in the case of the superfamily Hypochiloidea, in which there seems to be at least one more compact group. Similarly, the final status of the groups listed here as families is not quite clear, although it is probable that most of them are defined according to the standards by which most of the «Entelegyne» families are defined in this paper.

Mainly because of the difficulties mentioned above, no keys for the different groups of Filistatides are given, and the Ecribellate families are discussed only in so far as they show direct affinities with some of the Cribellate families.

A. Hypochilidae, Ectatostictidae, Hickmaniidae, Thaididae, and Megadictynidae

The discovery of a four-lunged Cribellate species, *Hypochilus thorelli*, immediately led to the creation of a new family (MARX 1888). On the other hand, the presence of the cribellum was overlooked in *Thaida peculiaris* in the original description by KARSCH (1880), and in *Theridion troglodytes* by HIGGINS & PETTERD (1883). The latter species was soon transferred to Cribellata by RAINBOW (1904), having meanwhile also been described independently as a representative of Hypochilidae by SIMON (1902 b). However, a separate genus, *Hickmania*, was first proposed for *T. troglodytes* by GERTSCH (1958 b). *T. peculiaris* was also independently described as a Hypochilid species, *Austrochilus manni*, by GERTSCH & ZAPFE (in ZAPFE 1955). ZAPFE (1955, p. 51) supposed that it might represent a different subfamily, but this opinion was not shared later by her collaborator (GERTSCH 1958 b). The genus *Ectatosticta* was included in Hypochilidae in the original description (SIMON 1892 b), and this opinion has subsequently been unanimously accepted.

These four genera constitute the family Hypochilidae of all recent authors. Various higher categories up to suborder (PETRUNKEVITCH 1933) have been proposed for this family, but no one has presented the possibility of phylogenetic relationship between Hypochilidae and some Ecribellate families. Besides, none of the four genera discussed above has ever been included in a Cribellate family other than Hypochilidae. It must also be emphasized here that a subdivision, even into subfamilies, has in

fact never really been carried out and argued in this strictly heterogenous assemblage of primitive Cribellate genera.

The position of an additional primitive genus, *Megadictyna*, is also discussed here, although it has never been placed in the vicinity of the four other genera mentioned above. F. DAHL (1907) described *M. thilenii* as a Dictynid species, and R. MARPLES (1959), independently, as *Ihurakius forsteri*, also in Dictynidae (s. lat.). The latter author considered *Ihurakius* as a relative of, e.g., *Phryganoporus*, that is, of a genus which has generally been included in Amaurobiidae.

The evidently primary lack of cheliceral boss and of distinct trichobothria make it easy to separate *Megadictyna* from Amaurobiidae and from any representative of Amaurobioidea of this size. Other sharply deviating patterns are found in the structure and armature of the cheliceral groove, spinnerets, male and female genitalia, and in the shape of the carapace. F. DAHL (1907) also emphasized the irregularity of the leg spinulation, and R. MARPLES (1959) mentioned the exceptional slowness of movement.

Megadictyna has only one pair of book-lungs as has also *Thaida*, but the tracheal stigma is distinctly unpaired in the former genus and paired in the latter. These two genera resemble each other in the shape of carapace, epigynal structure, and even in the general shape of cribellum and spinnerets. Unfortunately, it has not been possible for me to investigate the male palpal organs of *Megadictyna*, but the descriptions refer to the same general structure. Marked differences are found in the structure of the chelicerae, maxillae, and posterior spinnerets, as well as in the trichobothrial and general hair pattern. Thus it is obvious that no close relationship exists between *Megadictyna* and *Thaida*, in spite of strikingly similar habitus. They are regarded here as constituting the second main branch, Thaidides, but it is rather a matter of opinion whether they must be separated as superfamilies or families only.

After a detailed analysis of representatives of all families of spiders, and the resulting standardization of the limitation of families, I am convinced that all three remaining genera of Hypochilidae auct. also represent well argued families. Most probably each of them is the only survivor of a large group of ancient spiders.

The lumping of taxa on grounds of size only has been severely criticized, e.g., by BRISTOWE

(1938, p. 288) and also by GERTSCH (1958 a). Thus it is surprising to read the opinion of GERTSCH (1958 b, p. 3): »By some standards this might entitle it (*Austrochilus* = *Thaida*) to full family status, but the numerous points of similarity prompted me to broaden the family limits to include it in the Hypochilidae», while in the same year he emphasized the necessity of splitting Sicariidae (GERTSCH 1958 a, 1958 c). According to the results of the present analysis, such a broadening of the family limits of Hypochilidae would make it necessary to include in Hypochilidae all the subdivisions of the classical Sicariidae and also numerous other primitive spiders.

In fact, the morphological similarities of *Hypochilus*, *Ectatosticta*, *Hickmania*, and *Thaida* are restricted to the relative length of the legs and to the lack of cheliceral boss. The former character is a typical adaptation to troglophilous habits, and the latter is a common character of fairly primitive spiders, shared also, e.g., by the Cribellate families Filistatidae and Oecobiidae.

The most important characters of these four genera and *Megadictyna* are summarized in Table 2, and some of them are discussed below in more detail in order to explain why it was necessary to split the polyphyletic »Hypochilidae» as limited last by GERTSCH (1958 a).

An exceptionally high number of cardiac ostia and dorsoventral muscles, respiratory organs of Theraphosomorph type, the presence of more than one pair of primary seminal receptacula, the lack of a well-developed epigyne, and lack of, or irregularity in, the trichobothrial pattern of the legs, are distinctly primitive characters, and most of them, together with a thorough similarity to the less advanced Theraphosomorph spiders, are shared by some Ecribellate representatives of primitive Araneomorpha.

On the other hand, all other characters afford undisputable evidence against close phylogenetic relationship of *Hypochilus*, *Ectatosticta*, *Hickmania*, and *Thaida*.

Differences in the fundamental pattern of the male palpus alone suggest a different origin for the genera discussed here. A conductor is present only in *Hypochilus*, *Ectatosticta*, and *Thaida*, but evidently without being a homologous structure in them. Alveolus is apical in *Hypochilus* and *Ectatosticta*, but distinctly subbasal in *Hickmania* and *Thaida*, as well as in *Mega-*

dictyna. The subtegulum is weakly developed or lacking in *Ectatosticta* and *Hickmania*, while the type of embolus is entirely different in each of these genera, except that an advanced, thin, semicircular type is found both in *Thaida* and *Megadictyna*.

The structure and patterns of the hair covering also afford some convincing evidence. In *Hypochilus*, there appears only one type of hairs, which look simple even when considerably magnified, although the thick tarsal bristles are still more or less laminar in their microstructure. Presumably the reduction of the basic plumose-lamellar type of hairs in Araneomorpha has taken place several times independently, even within Filistatides. All the Ecribellate families that are here regarded as direct derivatives of ancient Hypochilids have only a single, simple type of hairs. Among the five genera discussed here, *Thaida* is unique in having feathery hairs as well as the basic plumose type, but among Ecribellate representatives of Filistatides Loxoscelinae, at least, also have them.

As stated above, primitive Araneomorph spiders have only a few well-developed trichobothria. In *Hypochilus* and *Hickmania* there is a single, long, subapical trichobothrium in the metatarsi, as in most Haplogyne Ecribellate spiders, but no tarsal and no distinct tibial trichobothria. The total lack of trichobothria in *Megadictyna* was emphasized also by F. DAHL (1907).

Thaida, however, has a well-developed trichobothrial pattern including a series of tarsal trichobothria. The trichobothrial pattern of Amaurobiides, and especially that of its most primitive superfamily, Amaurobioidea, could be derived from the pattern of *Thaida* described above. Altogether, such a seemingly adaptive and fundamentally rather simple pattern may have been developed independently as well. Cf. also the ontogenetic history of trichobothrial patterns in spiders in general (EMERIT 1964) and the critical analysis of the development of this kind of pattern (SONDHI 1963).

The spinulation of the legs is quite exceptional in *Hypochilus*, while the spine pattern of the remaining genera does not fundamentally deviate from the basic pattern of Araneomorpha as it is demonstrated in more primitive representatives of Amaurobiides and Zodariides. All the genera treated differ greatly in the structure of chelicerae, maxillae, labium, sternum, clypeus, and in eye pattern, *Hypochilus*

Table 2. Primitive

	Hypochilidae <i>Hypochilus</i>	Ectatostictidae <i>Ectatosticta</i>
Figure	14 and GERTSCH (1958 b).	15 and GERTSCH (1958 b).
Size	♂♀ large	♂ large, ♀ very large
Shape of abdomen	♂♀ long oval, anteriorly narrowed	♂ long oval, ♀ gibbous
Abdominal pattern	dark anterior folium + posterior reticulations + dark margins	central folium of Λ -shaped figures + lateral spots
Anterior spinnerets	long conical, converging	thick conical, apex truncate
PS: basal segment	short, distally thickened	long, cylindrical
PS: apical segment	cylindrical, apex rounded	distally tapering, diverging
PS: distribution of spinning tubes	distal circular area	ventromedian triangular area
Type of cribellum (undivided)	very wide oval	oval
Posterior respiratory organs	central lung-books	subcentral lung-books
Relative length of carapace	long pear-shaped, very flat	long pear-shaped, flat
Cephalic furrows	insignificant	weakly defined
Shape of fovea	quite shallow, branched	deep oval pit
Height of clypeus	$\frac{1}{2}$ $\varnothing$ AL	$> \varnothing$ AL
Shape of MOT	wide, strongly trapezoidal	wide trapezoidal
Shape of LOT	wide rectangular	wide rectangular
Relative size of eyes	AM variable, AL $\cong$ PL $\cong$ PM	AM minute, others subequal
Cheliceral armature	2 - 3 small & denticles + 5 unequal	9 small + 8 unequal
Labium	extremely wide, rebordered, soldered with sternum	wide, distally rounded, with separate lateral plates
Maxillae	oval, strongly diverging, medially with wide soft area	long reniform, diverging, medially with strong scopula
Sternum	oval, margins deeply notched, apex widely rounded, and surrounded by petiolar sternite	long oval, apex pointed, three pairs of marginal sigillae
Hair types	simple-serrate	plumose
Femoral spines	weak bristles only	6 - 7 dorsal and lateral
Tib. & mt. v. sp.	weak bristles + 3 - 5 pairs	5 - 6 + 4 (irregular)
Tarsal spines	numerous short ventral	♀: row of ventral spines
♂ leg modifications	tarsi slender, curved	tarsi slender, curved
Trichobothrial pattern	mt: 1 long subapical	mt: 2 long (subapical + central)
Ventral trochanteral notch	none	shallow
mt/t (I - IV, ♂♀)	2 - 2 $\frac{1}{4}$	1 $\frac{1}{2}$ - 2
Tarsal scopulae	practically absent	weakly developed
Calamistrum	subbasal in 2 rows ($\frac{1}{4}$ mt IV)	subbasal in 2 rows ($\frac{1}{4}$ mt IV)
Site of alveolus	apical	apical
Palpal tibia	long, basally thickened	very long and slender
Palpal femur	very long cylindrical	extremely long and slender
Cymbium	distally widened, ventrolateral boss with 2 setae	cylindr., dist. with ventrolateral boss and 6 setae + med. lamella
Embolus	thin spiral	distally tapering curved spine
Conductor	long screwed rod	triangular folded lamina
Epigynal plate	none	none
Seminal receptacula	2 pairs, small	?
Special characters	legs distinctly annulated	
Distribution	Nearctic (California - West Virginia)	China

being the most divergent. Cf. also the excellent illustrations by GERTSCH (1958 b).

On account of the presence of sternal sigillae in *Ectatosticta*, the derivation of this genus from *Hypochilus* becomes impossible. Altogether, this primitive character is rare among Araneomorpha, although present in the Filistatid genus *Kukulcania*.

The pattern of spinnerets proper is rather different in each of the five genera, nor are they similar to any corresponding Ecribellate families. Thus each of them might perhaps be regarded as an excessive adaptation.

According to the structure of cribellum and calamistrum, the special characters of Cribellate

spiders, these primitive genera can be grouped into three series. The calamistrum is basal and biseriate and the cribellum broad oval in *Hypochilus* and *Ectatosticta*. In *Hickmania* and *Thaïda* the calamistrum is central and uniseriate and the cribellum narrow, resembling that of most of the Cribellate spiders. The cribellum of *Megadictyna* is almost similar, but the calamistrum of this genus is basal, as in Amaurobiidae. For the structure of a «biseriate» calamistrum fundamentally different from the type above, see p. 339.

The respiratory organs, the basic pattern of the male genital organs, and the ocular pattern of Hickmaniidae and Gradungulidae are similar,

Cribellate groups.

Hickmanidae <i>Hickmania</i>	Thaididae <i>Thaida</i>	Megadictynidae <i>Megadictyna</i>
16 and GERTSCH (1958 b). ♂ large, ♀ very large ♂ long oval, ♀ gibbous ♂ obscure pattern of <i>Ectatosticta</i> type, ♀ unicolorous thick subcylindrical very short, disc-shaped distally tapering dorsomedian triangular area ± Amaurobioid type subcentral lung-books long pear-shaped, flat weakly defined deep oval depression > ♂ AL, central projection slightly trapezoidal wide, slightly trapezoidal AM small, others subequal oval area of denticles + 5 long, distally notched, rigidly united with sternum by seam reniform, with strong scopula oval, anteriorly narrowed and curved downwards plumose 2 basodorsal, 7 lateral I - III: 5 + 6, 8, IV: 5 + 3 absent II metatarsi s-shaped, with long, curly, erect hairs mt: 1 short subapical shallow 2 - 3 weakly developed central in one row (1/3 mt IV) subbasal cylindrical, with subapical boss cylindrical, rather long very long apex that is throughout furrowed thick rod with modified apex absent (cymbial furrow) none 2 pairs, minute Australian (Tasmania)	17 and GERTSCH (1958 b). ♂ large, ♀ large - very large ♂♀ oval two rows of light spots strongly conical rather long, cylindrical short conical distal oval area Amaurobioid type subcaudal tracheae with large atria long pear-shaped distinct deep oval pit > ♂ AL, central projection long trapezoidal wide trapezoidal AM small, other subequal 2 small & denticles + 5 wide, distally notched, loosely united with sternum reniform, with strong scopula oval, margins notched plumose + feathery numerous lateral & dorsal 4 + 3 - 4 (unpaired or irregular) absent none tib., mt. & t: short indistinct shallow 2 ¼ - 2 ½ moderately developed central in one row (1/3 mt IV) subbasal cylindrical cylindrical long and slender, ± oval long semicircular lamella large folded lamina semicircular projection ? chitinous plate behind epigyne Neotropical (Chile)	18 and R. MARPLES (1959, p. 350, Fig. 2-3) ♂♀ large ♂♀ oval, weakly gibbose obscurely spotted with dark pigment strongly conical short, cylindrical long, distally tapering ventral triangular area broad Amaurobioid type tracheae with unpaired caudal stigma short pear-shaped, rather high very distinct large triangular depression large oblique, 3 ♂ AL long rectangular wide rectangular AL ≥ PL ≥ PM > AM 0 + 1 long wide, obtusely triangular, no basal notches oval, strongly converging, with small scopula triangular, margins strongly undulate plumose 1 dorsal, 2 lateroapical 3 - 4 + 4 - 5 (short and irregular) absent none totally lacking none 1 ½ - 1 ¾ (♀ only) weakly developed subbasal in one row (2/5 mt IV) subbasal short with curved dorsal process short cylindrical oval with long apex thin, strongly coiled absent tongue-shaped projection 1 large + 1 small pair slow-moving Australian (New Zealand)

and a separate superfamily, Gradunguloidea, is here proposed for these families. FORSTER (1955 a) placed Gradungulidae in Hypochilomorpha without detailed discussion of the phylogenetic relationships with some named genera of Hypochilidae. GERTSCH (1958 b) emphasized the advanced structure of Gradungulids when compared with Hypochilids, but again without any reference to the exact derivation.

The chitinated epigynal area of *Gradungula* is a rare exception among the typically «Haplogyne» spiders, but no phylogenetic evidence for relationship with Plectreuridae and Diguettidae can be inferred from this simple structure alone.

Ectatostictidae seems to be most closely

related to Gradunguloidea, although its exact position remains obscure.

The only known representatives of the new branch Thaidides, *Thaida* and *Megadictyna*, are thus far removed from the position they have had until now. In this branch, there is a combination of primitive characters, e.g., the primary lack of cheliceral boss, and advanced characters, such as the structure of the male genital organs. A hypothesis is presented here that Thaidides represents the only living members of an ancient stock, which has given rise to Amaurobiidae and Zodariidae. Thus no close relatives of Thaidides can be found among the Ecribellate families.

Table 3. Filistatidae

	<i>Kukulcania</i>	<i>Filistata</i>	<i>Zaitunia</i>	<i>Pritha</i>
Figure	19	20	21	22–23
Size	very large – medium	large – medium	medium	medium – small
Cribellum	paired equilateral triangle	paired equilateral triangle	paired equilateral triangle	paired equilateral triangle
Abdominal pattern	narrow obscure folium	none	none	transv. light bands – none
Pattern of carapace	practically none	dark centr. & margin. bands	none	none
Fovea	long oval, very deep in ♂	rhomboid oval – indistinct	none	none
Size of eyes	AL > PL > PM = AM	AL ≥ PL > PM > AM	AL > PL = PM = AM	AL ≤ PL > PM > AM
Shape of MOT	wide trapezoidal	trapezoidal (eyes widely spaced)	very wide trapezoidal	trapezoidal – wide trapezoidal
Labium	♂ very long, ♀ long	1–3 times longer than wide	wider than long	long – as long as wide
Sternum	short oval with sigillae	pear-shaped	subcircular	short oval
Femoral spines	numerous short ventral + a few long dorsal	1 basodorsal + 0–3 apical prolateral	1 basodorsal + 1–2 prolateral	none
Tib. & met. v. sp.	3–6 + 6–10 pairs, irregular	1 unpaired + 3–4 irregular	3 + 3–4 pairs, long	none (or I: 0 + 1)
Tarsal spines	I–IV: numerous in 2 irreg. rows	II–IV: 2–5 short in one row	none	none
Calamistrum	curved row of coarse hairs	curved row of coarse hairs	2 rows of 2 strong bristles	in 2 rows, length variable
Cymbium	long cylindrical	short cylindrical	rather short cylindrical	horseshoe-shaped
Palpal tibial modifications	long and slender, cylindrical	long cylindrical	moderately thickened cylindrical	strongly thickened
Shape of tegulum	long oval	long oval	short oval	distally gradually tapering
Ejaculatory duct	2–4 times tightly coiled	1½–2 times tightly coiled	thick, 2–3 coils	very thick, U-shaped
Embolus	complicated laminar – simple distally tapering	distally tapering	short transversal lamina	thin, straight – weakly curved
Special characters	distinct sexual dimorphism in leg spinulation; ♂ tarsi curved and with false joints; ocular area strongly elevated	ocular area exceptionally narrow	tarsi ventrally with numerous short spatulated hairs; carapace subcircular; maxillae rectangular; clypeus with a tuft of erect hairs	female palpi often thickened
Distribution	Neotropical – W. Nearctic	S. Palearctic	E. Mediterranean	Australian – Oriental – Ethiopian – Mediterranean

B. Filistatidae

The limitation of the family Filistatidae has always been easy because of its highly specialized structure. However, the generic criteria for the type genus, *Filistata*, have often been regarded as criteria for the whole family. Consequently, *Filistata* has been believed to be world-wide. Some additional Neotropical genera have been described, and MELLO-LEITÃO (1946) summarized the characters of all genera known up to date. As regards the genus *Filistata*, his paper was based solely on the Neotropical species that have generally been included in it, and not on the genotype or other related species.

As to Filistatidae, my revisional work is seriously deficient, as the original aim of this study was only the revision of genera already described. Table 3 summarizes the results until now. Several new genera had to be created to come up to the general standards of arachnology, but no subfamilial division has been carried out, although it is possible that there are groupings which could be treated as subfamilies. Three series of related genera may be

listed here, viz. *Kukulcania* – *Filistata* – *Zaitunia*, *Pikelinia* – *Filistatinella*, and *Andoharano* – *Pritha* – *Filistatoides*. The last group at least may be polyphyletic, if a convergent evolution of the male palpus can be supposed to have occurred in both the Old World and the New. I have not seen any material of *Malalidata*, and the original description only emphasizes the lack of all tarsal claws (MELLO-LEITÃO 1938, 1946). If this is really true, *Malalidata* would be unique in this respect in the whole order Araneae, but I view the original description with considerable doubt.

The family Filistatidae seems to stand rather isolated among the Ecribellate representatives of the branch Filistatides. On the other hand, the prevailing evolutionary trends in this branch tend to differ fundamentally in direction from the most distinct trends in Amaurobiides and Zodariides, at least. Besides, former opinions on this topic seem to be largely contradictory. According to my analysis, Filistatidae looks especially advanced, in spite of some certainly primitive characters (sternal sigillae, simple genital organs).

ie.

<i>listatoides</i>	<i>Andoharano</i>	<i>Filistatinella</i>	<i>Pikelinia</i>	<i>Malalistata</i>
PF (1961, Fig. 3-8)	24	GERTSCH (1935, Fig. 4-6)	MELLO-LEITÃO (1941, Fig. 1)	—
small - medium	medium	minute	small	medium
narrow transv. bipartite universal light bands	narrow transv. bipartite centr. row of dark patches	narrow transv. bipartite none, hairs scale-like	? obscure	? none
no rows of dark spots distinct longitudinal $PL > AM \geq PM$ de trapezoidal	central decorated band none $AL > PL > PM > AM$ wide trapezoidal	dark margins distinct longitudinal $AL > PL > PM > AM$ wide trapezoidal	none ? $AL > AM > PL = PM$ trapezoidal	none small depression $AL > AM; PL \cong PM$ wide trapezoidal
slightly longer than wide ar-shaped - oval	long subcircular	slightly longer than wide long oval	? ?	? ?
ventroapical bristle	none	I: 1 basodorsal	none	none
ne - III - IV: 0 + 1 pair ne	none none	♂ I - II: 1 + 0, ♀ none none	I - II: 0 + apical pair none	none none
short in 2 rows	short in two rows	short in two rows, thin setae	?	short in 2 rows
rather long cylindrical unmodified cylindrical	minute subrectang. disc distally gradually thickened	long curved + d. tuft of hairs very thick; ventral erect hairs and basal hook	short disc-shaped very thick; distal pointed process horn-shaped ?	♂ unknown
long conical straight in, weakly curved	long conical thick, 1 ½ coils short and thin, apex twisted	long and slender ? thick lamella	strongly curved	
		carapace subcircular		totally without tarsal claws; tarsi apically thickened
Neotropical	Malagasy	S. Nearctic	C. Neotropical	S. Neotropical

C. Ecribellate derivatives

The presence of Dipneumone Ecribellate derivatives of Hypochilidae auct. has never been proposed, although PETRUNKEVITCH (1923 and 1933), for instance, derived many Ecribellate families from other Cribellate groups, and also noticed the relationship between Filistatidae and Plectreuridae within the branch Filistatides, that is, in typically Haplogyne spiders. GERTSCH (1958 b), indeed, noticed the resemblance in habitus of *Pholcus* and *Hypochilus* but without indicating any true relationship, and KRAUS (1965) mentioned astonishing similarities between the behaviour of Pholcids and *Hypochilus*, but he considered them to be a convergence between phylogenetically distant groups. GILTAY (1925), BRISTOWE (1938), CAPORACCO (1938), and KASTON (1964) also place Hypochilidae in their dendrograms as a separate branch without any derivatives at all.

In the present classification the superfamily Hypochiloidea includes Hypochilidae, Leptonetidae, Ochyroceratidae, Pholcidae, and Scytodidae, at least. All the Ecribellate families listed are certainly more closely related to

Hypochilidae than to any Cribellate or Ecribellate families outside this group, but the mutual relations can be finally determined only by a thorough revision of all species of these families.

After personal investigation of both *Telemidenella* Sim. 1882 and *Apneumonella oculata* Fage 1921, I am convinced that the family Telemidae must be annulled. Both these genera are here included in Leptonetidae, as the only difference - the lack of book-lungs in Telemids - has been proved to have no absolute phylogenetic value (see p. 278). Besides, the genera *Telemidenella* and *Apneumonella* are most probably not closely related, but rather represent parallel evolution within Leptonetidae.

The subfamily Drymusinae is here tentatively left in Scytodidae, where it has been placed since SIMON (1893 a). In any case, the Neotropical *Drymus nubila* Sim. 1891 is not congeneric with the genotype, *D. capensis* Sim. 1893, and other Ethiopian species. No generic name is here proposed for *D. nubila*, because a detailed revision of the Haplogyne spiders has not been carried out.

The superfamily Hypochiloidea is well char-

acterized by the eye pattern, colour pattern, structure and patterns of hairs, leg spinulation, adaptive structure of maxillae, labium, and chelicerae, and by the long and well-developed colulus in most of the Ecribellate representatives. The family Pholcidae shows numerous advanced characters, such as chitinous epigyne, complicated male palpus, reduction of posterior respiratory organs and colulus, but none of the characters contradicts the hypothesis that Pholcidae can be directly derived from ancient Hypochilids. See also CROME (1955 b, p. 572).

The phylogenetic relationships within Filistatids that are suggested here are not nearly so reliable as those presented, e.g., for Amaurobiidae. Therefore the resulting classification is not emphasized in the discussion below, but rather the trends observed and the exceptional range of variation of some characters have been summarized as a basis for further opinions.

The ocular pattern typical of the suborder Araneomorpha is rare in the whole branch discussed here, and especially so in the closest suggested relatives of Filistatidae. In any case, it seems improbable that there could be an entirely different basic pattern for this branch, as, in addition to Gradunguloidea, there are eight eyes in two almost straight rows in Plectreuridae, the family that shares most characters with Filistatidae.

The main types of modification of ocular pattern are as follows. The reduction of eyes in Caponiidae deviates from all other lines of evolution, as the anterior median eyes, that is, the only direct eyes, always persist, while all the indirect eyes may be reduced. The order of reduction is always reverse in Amaurobiidae and Araneidae, as well as in all other lines of evolution within Filistatidae. In the latter group, however, a gradual reduction resulting in species with minute anterior median eyes occurs only in some Pholcid genera, while there are at most six eyes in all species of Scytodidae, Ochyroceratidae, Leptonetidae, Sicariidae (including Loxoscelinae), Periegopidae, Diguettidae, Dysderidae, Oonopidae, and Segestriidae. Besides, the eyes tend to be grouped in three pairs far apart from each other, except in Dysderidae and Oonopidae, in which all the eyes tend to be clumped together. In Oonopidae, the number of eyes may be further reduced to four (*Tetralemma*), two (*Diblemma*), or even to a single unpaired median eye (GERTSCH 1941: *Monolemma*), while in all other families of spiders

except Oonopidae and Caponiidae, the reduction from six eyes to totally eyeless forms generally occurs without intermediate phases. The only exception is the Symphytognathid genus *Anapistula* (GERTSCH 1941).

In contrast to all other Haplogyne spiders, Filistatids have eight eyes in a highly modified pattern, somewhat resembling that of Oecobiidae, Hersiliidae, or Hadrotarsidae. These three families are here included in Oecobiidae, and in spite of their rather uncertain position there, derivation of these families from Filistatidae or *vice versa* seems to be the least probable alternative.

A further general trend in Filistatidae is found in the doubling of the row of teeth in tarsal claws. Most probably this has developed independently in Hypochiloidea (Scytodidae), Gradunguloidea (Gradungulidae), and Filistatoidea (Oonopidae). In the latter family, the modification has sometimes led to strange lateral plates, as in *Tasmanoonops* (HICKMAN 1932).

The apex of the tarsi tends to be modified in Filistatidae in other ways also. A separate apical «segment», onychium, is especially well developed in Caponiidae, Plectreuridae, and Oonopidae, all of which are here assigned to Filistatoidea. However, this character certainly can arise through convergence, as it is distinct in, for example, the Liocranid genus *Apostenus* in Amaurobiidae.

Neotropical Caponids of the genera *Nops*, *Orthonops*, and *Caponina* constitute a compact group. The presence of only two eyes (the direct ones), and of strange membranous plates on the ventral side of the legs, possibly justifies the separation of the subfamily Nopinae as a new grouping among the Haplogyne spiders.

A further general trend in Filistatidae is the reduction of the posterior respiratory organs. Both Filistatids and Plectreurids have only weakly developed tendons representing the posterior tracheae. These have usually been considered as rudimentary tracheae, homologous to the posterior lung-books of primitive spiders, e.g., by GERHARDT & KÄSTNER (1938–1941), but YOSHIKURA (1954 a) regarded the tracheae of *Filistata* as corresponding to the additional simple «respiratory organs» of *Heptathela kimurai*, Liphistiomorpha, in the third abdominal segment.

The basic trichobothrial pattern of Filistatidae consists of a single apical metatarsal trichobothrium and a few basal tibial ones,

while there are usually none in the tarsi. Thus the tarsal trichobothrial pattern of Caponiidae is convergent with the similar basic pattern of Amaurobiidae. There are also different patterns of tarsal trichobothria in some other groups of Filistatidae, e.g., in Plectreuridae.

The spine pattern of Haplogyge spiders is largely variable, and even when there is a distinct and stable pattern within a genus it is often difficult to deduce it from any basic pattern. Further investigations will probably reveal some phylogenetic value for this character also.

To summarize the above facts and all other evidence presented concerning the representatives of the branch Filistatidae, it is here preliminarily divided into three superfamilies – Hypochiloidea, Gradunguloidea, and Filistatoidea. The first two have already been discussed, while the superfamily Filistatoidea is here regarded as consisting of Filistatidae, Plectreuridae, Caponiidae, Oonopidae, and Dysderidae, at least. The New Zealandian subfamily Periegopinae is here transferred from Sicariidae to Plectreuridae, although it could represent a family as well. Cf. also parallel opinions by BRYANT (1935 a, 1935 b). Unfortunately, I have not been able to examine the male of *Periegops suteri* (Urquh.) 1891, but only a female specimen, originally described as *P. hirsutus* Sim. 1893.

The position of Sicariidae with its two subfamilies, Sicariinae and Loxoscelinae, of Digueidae, and of Segestriidae, remains uncertain. Any of them could represent a separate superfamily, but, on the other hand, the adaptive modifications within this main branch are often surprisingly great, and additional research is needed for placing them. I have personally investigated representatives of type genera of each of these families.

Segestriidae has often been included in Dysderidae as a subfamily, but PETRUNKEVITCH (1933) showed that they have only two pairs of cardiac ostia, and my own investigations revealed the presence of a curious serrate type of hairs in them. The inclusion in Dysderidae was made only on account of the unmodified type of maxillae and chelicerae, and there is no reason to believe that these two families are related to each other.

On the other hand, the modification of the hair structure of Segestriidae cannot be interpreted to prove direct phylogenetic relationship with Hypochiloidea, but rather a mere con-

vergence. Besides, the structure of hairs in these two groups is not exactly similar either.

Digueidae and Sicariidae have typical plumose-lamellar hairs, and thus they cannot be included in Hypochiloidea, at least not in the main branch.

The fossil family Phalangitidae is unknown to me, but possibly it has an affinity with Filistatid ancestors, as first supposed by BONNET (1959).

3. Oecobiidae

Opinions concerning the phylogenetic relationship of the classical families Oecobiidae and Urocteidae have varied depending on the general treatment of the Cribellata, as their great similarity in general appearance is undisputed. Thus only the supporters of independent evolution of the Cribellata have considered the similarity to be convergence, e.g., SIMON (1892 a, 1893 a).

In placing the family Oecobiidae in different subdivisions of Cribellata no detailed argumen-

Table 4. Oecobiidae: subfamilies.

	Oecobiinae	Urocteinae
Size	minute – small	medium – large
Cribellum – colulus	cr; $\pm$ distinctly bipartite	co: large plate
Pattern of spin-nerets	PS long, others subequal	PS long, others subequal
Anal tubercle	large with long curved marginal hairs	large with long curved marginal hairs
Shape of carapace	subcircular with clypeal snout	reniform – subcircular with clypeal snout
Eye pattern	compact group along eye tubercle; PM not circular	compact group along eye tubercle, PM subcircular
Femoral spines	1 dorsoapical – none	3 rows (dorsal and lateral)
Tib. & met. v. sp.	0 – 1 + 0 – 2	4 – 6 + 4 – 6
Tarsal spines (ventral)	IV: 1 – 2 rows, III a few	I – IV: numerous
Metatarsal trichobothria	1 apical	1 apical
Palpal tibia of δ	short unmodified	$\pm$ globular
Embolus	short $\pm$ hooked spine	long curved spine
Conductor	complicated sclerite	simple membranous
Other bulbal apophyses	1 large branched	1 large complicated
Epigynal plate	variable, often with caudal notch, seldom with anterior pit	variable, often with caudal notch and anterior pit
Epigynal specialities	epigynal area transversally furrowed	epigynal area transversally furrowed
Distribution	world-wide	Palaearctic – Oriental – Ethiopian + fossil

Table 5. Oecobiidae: Oecobiinae.

	<i>Oecobius</i>	<i>Maitreja</i>	<i>Ambika</i>	<i>Thalamia</i>	<i>Tarapaca</i>	<i>Platoecobius</i>
Figure	25, 28	31	32 and KRITSCHER (1966b Fig. 11)	26, 29	27, 30	CHAMBERLIN & IVIE (1935, Fig. 22–32)
Size	small	minute	small	small – minute	minute	small
Cribellum	bipartite	bipartite	bipartite	bipartite	bipartite	bipartite
Abdominal pattern	central folium	central folium + dark margins	central folium + dark margins	central folium + spotted	central folium + spotted	± unicolorous
Shape of carapace	subcircular	high subcircular	rather flat, reniform	transversal oval	subcircular, rather high	flat transversal oval
Clypeal triangle	short and wide, obtuse	± pointed, margins concave	short and wide, obtuse	short and very wide	short and wide, but ± concave	short and wide, rounded
Fovea	short longitudinal	totally absent	only transversal depr.	short + transversal depr.	long and rather deep	?
Size of dark eyes	AM < PL	AM ~ PL	AM > PL	AM ≥ PL	AM > PL	AM ~ PL
Pattern of dark eyes	trapezoidal	trapezoidal	very wide trapezoidal	trapezoidal	trapezoidal	very wide trapezoidal
Sternum	as long as wide, apex widely truncate	much wider than long, apex rounded	wider than long, apex rounded	wider than long, apex widely pointed	long heart-shaped – wide, apex ± distinctly pointed	as long as wide, apex shortly pointed
Leg spinulation	weak	very weak bristles	very weak bristles	strong spines	long and strong spines	very weak bristles
Tarsal spines	IV: 2 ventral rows, III: a few	absent	IV: 1 ventral row	IV: 2 ventral rows, III: a few	IV: 2 ventral rows	? absent
Distinct metatarsal trichobothria	1 distal	1 distal	2 distal	1 distal	2 distal	none
Length of palpal tibia	as long as wide	♂ unknown	(♂ not available)	as long as wide	very short	♂ unknown
Embolus	strong hook			short spine	curved hook	
Distal part of conductor	narrow outstanding rod			large folded plate with furrowed surface	membr. part surrounded by 2 chitinous lists	
Lateral part of conductor	very large with a tri-branchiate basal projection and a long tooth close to embolus			basal folded plate and a thin lateral lamina	small cup-shaped lamina	
Basal apophysis	very large with acute apex and 2 lateral lobes			bibranchiate lamina, both apices rounded	strongly concave plate with 2 acute marginal projections	
Distal margin of tegular pit	± unmodified			with a short and thick tooth	with long and narrow tooth	
Distal margin of epigynal plate	central, concave	central, concave	anterior, weakly concave	caudal, ± straight	surrounding a chitinous area	obscurely limited
Epigynal specialities	longitudinal pair of chitinous lists	small anterior pit	–	longitudinal pair of hollow chitinous lists	oval sclerotized pit with an anterior tongue	short chitinous lists
Seminal receptacula	small oval, anterolateral	2 pairs, anterior	very large longitudinal, caudal	small subglobular, anterior	long oval, lateral	globular, caudal
Distribution	Mediterranean	Oriental	Oriental – Mediterranean	synanthropically cosmopolitan (originally ? Palearctic)	Neotropical – S. Nearctic	N. Neotropical – S. Nearctic

tation has been presented, and this problem is not worthy additional discussion here.

Most of the authors who have accepted the phylogenetic affinity of Oecobiidae and Urocteidae have treated them as different families, but CHAMBERLIN & IVIE (1935) dropped the former as a subfamily of Urocteidae. I agree with them, except that I prefer to call the resulting family Oecobiidae, thus applying the fundamental principle of priority as laid down in ICZN (1964). Neither of these family names was so used in the past as to prevail now over the other.

The subfamilies Oecobiinae and Urocteinae are compared in Table 4.

Like Filistatids, the Cribellate Oecobid spiders have usually been grouped into a single genus, *Oecobius*, which was thus made both cosmopolitan and very variable in regard to genital structure. Here it has been divided into six different genera (Table 5).

The corresponding Ecribellate species have generally been listed under the generic name *Uroctea*. I am not well acquainted with most of the species described, and thus no splitting has been carried out.

The main difference between the Oecobine and the Urocteine spiders seems to be the presence and absence respectively of a functional cribellum.

Differences in spinulation of legs and in trichobothrial pattern are easily explained by the general correlation of these characters to the average size of the spiders.

The most convincing arguments for the phylogenetic relationship of *Oecobius* and *Uroctea* were presented by MILLOT (1931 c), who studied the anatomy of their spinnerets.

The family Hersiliidae seems to be closely related to Oecobiidae. The structure of the genital organs, modification of the carapace, eye pattern, and hair, as well as spine pattern of the legs, give particularly clear proof of true phylogenetic relationship. Moreover, CROME (1957) has noted similarities in ethological characters. MELLO-LEITÃO (1941 a) and PETRUNKEVITCH (1958) have suggested the superfamily Oecobioidea, including Oecobiidae, Urocteidae, and Hersiliidae, while the Ecribellate members are identical in the Hersiliiformia of CAPORACCO (1938). BRISTOWE (1938) brings together Hersiliidae and Urocteidae as successive sections of his Clubionoidea.

The more distant phylogenetic relationship of these families remains uncertain. However,

the families Hadrotarsidae (cf. p. 293) and perhaps also Dinopidae (cf. below) may belong to this main branch of Araneomorph evolution.

4. Dinopidae

The placing of Dinopidae in the revised system of Araneomorpha has been a constant source of trouble during the present study, and as yet there are no confirmed results. Representatives of this family show exceptional invariability in most of the structural characters useful for a phylogenetic analysis. All the recent Dinopids have adapted themselves to the same environment, and this adaptation is reflected in most of the structural characters. Even the structure of the genital organs reveals no important signs of phylogenetic affinities. The curious spiralization of the embolus has been shown to affect the basic pattern of the male bulbus, and therefore it is not certain whether the Dinopid palpus has been developed from a simple type or from a more complicated type similar to that of Amaurobiides or Zodariides.

SIMON (1892 a) included Dinopidae as a subfamily in his Uloboridae, obviously on account of the presence of abdominal tubercles. MILLOT (1933 a) showed that the anatomical characters of these two groups are largely different, but he could not place Dinopidae more exactly. Since then, Dinopidae has usually been grouped close to Uloboridae or Dictynidae without dependable argumentation.

The most important Dinopid characters are the trend towards modification of the abdomen and the eye pattern, as well as the presence of a cheliceral boss, feathery hairs and an exceptional cribellum. On the other hand, the structure of the anal tubercle, which has been emphasized by many earlier authors, cannot be used for phylogenetic analysis, as there are no clear-cut types at all, but only a series of different lengths depending on the functions of the spinneret complex.

Various alternative affinities of Dinopidae have been thoroughly weighed during this work, and three of them seem to be more probable than any of the others:

a) Dinopidae is a deviating branch of Oecobiides.

b) Dinopidae is a deviating branch of Araneides and more closely related to Uloboroidea than to Araneoidea.

c) Dinopidae constitute the only living rem-

Table 6. Dinopidae.

	<i>Dinopis</i> (s. lat.)	<i>Avellopsis</i>	<i>Avella</i>	<i>Menneus</i>
Figure	36, 39	33, 37	34 – 35, 38, 41	40
Size	very large – large	medium – large	large – very large	very large – large
Shape of ♀ abdomen	± rhomboid – long oval	long oval	oval	long oval
Abdominal tubercles of ♀	1 – 2 pairs (variable in size)	1 pair (central)	1 pair (central)	very long unpaired
Shape of ♂ abdomen	long and narrow, central tubercles absent or small	long oval (no sexual dimorphism)	long oval, central tubercles smaller than in female	long and narrow, no tubercles
Dorsal abdominal pattern	± obscure with black spots	very distinct folium	simple folium + transv. white band	obscure folium + black spots
Ventral whitish areas	lateral bands – indistinctly limited rows of large spots	4 wide oval patches	lateral bands – obscure patches	lateral bands
Shape of cephalic area	usually caudally narrowed (not in generotype!)	caudally narrowed	± rounded, margins parallel	± rounded, margins parallel
Shape of thoracic area	anteriorly widest (– oval)	anteriorly widest	anteriorly widest – oval	± oval
Hair pattern of carapace	short spinules often present, variable hair types	feathery hairs only	feathery hairs + short normal hairs	feathery hairs + lanceol. hairs
Pattern of carapace	variable or none	obscure central band	distinct central band	distinct central band
Horns on carapace	above PM or central or none	none	none	none
Size of eyes	PM very large, AM smallest	PM > AL ~ PL > AM	PM, AM & PL subequal, AL smallest	PM > PL ~ AM > AL
Shape of MOT	wide triangular – trapezoidal	trapezoidal	wide trapez. – trapezoidal	wide trapezoidal
Shape of LOT, width/length	reverse trapez. – rectang. 1 ½ – 2	reverse trapezium, ca. 1 ½	reverse trapezium, 1 ½ – 2 ½	reverse trapezium, ca. 2
Fovea	deep oval pit – insignificant	insignificant	shallow depression	± insignificant
Posterior cheliceral teeth	5 – 8; first and last largest	4, first and last largest	8 – 10, irregularly unequal	5, first and last largest
Anterior cheliceral teeth	3 – 6, widely spaced, 1 – 2 small	4 subequal widely spaced	4 subequal widely spaced	4 subequal widely spaced
Central row of denticles	3 – 6 in an irregular row	absent	3 – 5 in an irregular row	4 – 5 in an irregular row
Sternum	± triangular	long triangular	long oval, caudally tapering	long oval, caudally tapering
Labium	long – as long as wide, narrowly rebordered	as long as wide, widely and strongly rebordered	long – as long as wide, hardly rebordered	twice as long as wide, weakly rebordered
Spinulation of femora	horns on tubercles or numerous short spines or a few spines and minute spinules throughout	moderately short spines	numerous short spines	numerous short spines
Tarsal spines	two rows of ventral spines or none	weak ventral bristles	lateral pair + a few ventr. distal	none
Palpal tibia of ♂	very long cylindr. – club-shaped	club-shaped	cylindrical	long cylindrical
Central apophysis	bi- or trilobate sclerite	outstanding simple lamella	bilobate lamella, ± concave	hammer-shaped lamella
Apex of embolus	± laminar (– unmodified)	unmodified	slightly flattened, embolus short	unmodified
Epigynal area	triangular – semicircular	adult ♀ unknown	long rounded – semicircular	± semicircular
Epigynal plate	triangular – transversal		acute triangular	rounded triangular
Special characters		♂ legs extremely long and slender, no sexual dimorphism in the shape of abdomen		
Distribution	Circumtropical	S. Ethiopian	Australian – E. Oriental	C. & S. Ethiopian

Table 7. Principal groups of Amaurobiidae. Sparassoidea and all isolated families are omitted.

	Amaurobioidea	Lycosoidea	Pisaurioidea	Gnaphosoidea
Cribellum – colulus	Cribellate & Ecribellate	Ecribellate & some Cribellate	Ecribellate	Ecribellate
Pattern of spinnerets	BP or moderately modified	BP or insignificant modifications	BP	usually strongly modified
Abdominal pattern	anterior folium and $\pm$ segmentally arranged transversal bands	anterior folium and $\pm$ segmentally arranged transversal bands	BP: large folium with undulate margins throughout the dorsal side	variable: simple folium or large light spots
Eye pattern	2 rows, AM very variable in size	3 rows (4 – 2 + 2) or (2 + 4 + 2); AL often oval	2 rows (procurved & recurved) or 4 rows; AL on $\pm$ distinct elevations	2 rows or modifications other than listed on the left; PM often oval
Structure of chelicerae	very variable in regard to shape and armature of grooves; sexual dimorphism often present	shape and armature of grooves only with insignificant variation	shape and armature of grooves only with insignificant variation	rather variable in shape and armature
Feathery hairs	present or absent	usually absent (excl. Zoridae: <i>Hestimodema</i>)	always present, usually abundant	usually absent
Tarsal trichobothria	usually in one regular row, increasing in size distally	usually in a modified pattern that can be derived from BP of Amaurobioidea	usually in one row	in 2 or 3 rows
Trochanterae	unnotched or notched	usually notched	always notched	usually unnotched or weakly notched
Tarsal claws	3 or 2	3 or 2	3	2
Palpal characters of σ : Primary conductor	present or reduced	present or reduced	present	present or reduced
Secondary cond.	absent or present	present or seldom reduced	(primarily) absent	present or reduced
Median apophysis (basally movable)	present or reduced	present or seldom reduced	present	present
Epigynal characters of φ : Lateral teeth	often distinct	often distinct or lateral lobes	absent or at least thoroughly modified	absent or at least thoroughly modified
Treatment of egg-cocoon	usually attached to the web, sometimes to a firm surface, seldom carried by spinnerets	usually carried by spinnerets or chelicerae, seldom attached to a firm surface	carried by chelicerae or attached to a firm surface	attached to a firm surface
Catching of prey	primarily with funnel web that has been reduced in several lineages	usually by hunting	usually by hunting	usually by hunting (live in silken tubes)

nants of a branch that was long ago separated from the Araneomorph stock.

Additional argumentation of any of these alternatives seems to be unnecessary speculation, and the problem must be left unsolved.

5. Amaurobiidae

This branch includes the bulk of the recent Cribellate spiders, and during this study it has also been investigated most thoroughly. Thus a generic revision is presented here for some families including only Ecribellate genera which have been found to be direct derivatives of certain Cribellate families.

On the other hand, the proximal part of the pedigree of Amaurobiidae is an exceptionally

homogeneous group, where most of the characters influencing the general appearance of a spider are variable only within a very narrow range. Thus it is also self-evident that any classification, based on a single character or at most on a few, tends to be unnatural in such a group. A thorough phylogenetic revision has led, indeed, to radical changes in the taxonomy of Amaurobiidae, and especially in the nominate superfamily Amaurobioidea. The difficulties of phylogenetic analysis of other homogeneous groups are discussed, for example, by Bock (1963). He also emphasized that hesitation concerning the absolute validity of some principles, based on the study of heterogeneous groups, is justified (Bock 1963, p. 265).

A. Amaurobioidea

The concepts of definition and limitation of families and subfamilies in this group have varied greatly. In fact, even the limitation of approximately corresponding superfamilies has been a matter of continual disagreement among different authors, and none of them has actually proposed a superfamily that could be critically compared to my Amaurobioidea. Concerning its Cribellate representatives, BLACKWALL (1841 a) first proposed a different family, Ciniflonidae, for some species now included in *Amaurobius* and *Lathys*. LEVI & KRAUS (1964) finally solved the complicated nomenclatory problem by proposing official invalidation of the name Ciniflonidae in favour of Amaurobiidae. MENGE (1866) proposed a new family for the genus *Dictyna*, but he used only the German name «Lauerspinnen» for it. The first use of the name Dictynidae is credited to O. PICKARD-CAMBRIDGE (1871). Thus the name Amaurobiidae (THORELL 1870 a) has priority over Dictynidae, when a single Cribellate family is regarded as including *Amaurobius*, *Dictyna*, and related genera, as first proposed by SIMON (1874). This is the Dictynidae *sensu lato* of many later authors. In recent times, HOLM (1945, 1950), MILLER (1947), LOCKET & MILLIDGE (1951), and R. MARPLES (1959), at least, have used the name Dictynidae only in this sense.

BERTKAU (1878) first listed Amaurobiidae and Dictynidae as different Cribellate families. F. DAHL (1904) observed that some of his Dictynids have tarsal trichobothria, while others have not. This fact has since been generally used as a key character in separating Amaurobiidae and Dictynidae (PETRUNKEVITCH 1923 and 1928, LAMEERE 1931, and CAPORACCO 1938). The presence of tarsal trichobothria in Dictynidae s. str. had, however, already been noticed by F. DAHL (*op. cit.*), even in a group of species that has often been included in the nominate genus *Dictyna*. A rapid survey of the tables in this chapter reveals the unavailability of the tarsal trichobothrial pattern for phylogenetic classification of this group.

PETRUNKEVITCH (1933) supposed that the tracheae of all Dictynids are distributed up to the cephalothorax, while in Amaurobiidae they would be restricted to the abdomen. In fact, he examined this character in only two genera of each of these families. The great variability of tracheal distribution in some groups of Amaurobioidea was first realized by B. MARPLES

(1962) in describing the presence of both the extreme cases mentioned above within a single genus, *Matachia*. I have personally examined the tracheal distribution of a couple of dozen genera distributed throughout my families Amaurobiidae, Dictynidae, and Titanocidae. It is very variable in some groups, especially in Matachiinae, but it seems to have some taxonomic value in Macrobuninae, at least.

PETRUNKEVITCH (1923, 1928) further emphasized the significance of the shape of the maxillae as a key character between Amaurobiidae and Dictynidae, but the tables in this chapter prove that this supposition is wrong. They also show the worthlessness of the other characters that have repeatedly been used to define these two families, viz. the average differences in the structure of cribellum and calamistrum and the average size. The colouration of the anterior median eyes varies constantly within this group of families.

All the characters listed above are of practical use in showing the differences between the most common and widespread Holarctic representatives *Amaurobius* and *Callobius* (Amaurobiidae), and *Dictyna* (Dictynidae), respectively, but when all the genera assigned to these Cribellate families are taken for comparison, the impossibility of a clear-cut bifurcate grouping of the Cribellate Amaurobioidea becomes evident.

Moreover, the classification of this group becomes more difficult when the independent reduction of the cribellum is taken into account. Although the derivation of different Ecribellate families from structurally similar Cribellate ones has been repeatedly proposed, a close relationship between Agelenidae auct. and Amaurobiidae has been proposed only by PETRUNKEVITCH (1923, p. 146, 155 and 164), in spite of fundamentally similar basic patterns of the shape of abdomen and carapace, colouration, trichobothria, etc. As long as the taxonomic value of the cribellum was not emphasized, THORELL (1870 a) placed Amaurobiinae as a subfamily of Agelenidae, but this practice has not been accepted by subsequent authors.

During my revisional work, FORSTER (in litt.) informed me that he has had difficulty in separating some New Zealand Amaurobids and Agelenids, and ROTH (in litt.) has also had difficulty in limiting these families in the Neotropical. However, ROTH told me that in limiting these families he prefers the presence of the cribellum to other character combinations available for

this purpose. As the evolution of the cribellum has now been traced in detail within Amaurobioidea, I cannot agree with ROTH, whose principles inevitably lead to a horizontal classification. Cf. ROTH (1967 a).

The family name Agelenidae is the oldest one in the group treated in this chapter, having been first used by C. L. KOCH (1837) and, if the whole group is to be treated as one large family including all its Cribellate as well as Ecribellate genera, the most appropriate name would be Agelenidae. When only structural variation between the extreme representatives of Amaurobioidea is measured, and compared with the total range of variation in, e.g., Thomisidae and Araneidae, without any emphasis being laid on the strength of prevailing trends towards structural modification in general, the superfamily Amaurobioidea might be treated as a single family. In this paper, however, the superfamily Amaurobioidea is especially characterized by conservatism as regards general appearance. On the other hand, the structural variation in some details, such as the structure of male and female genital organs, is exceptionally large, and the range of habitats occupied by Amaurobioidea is wider than that occupied by Thomisidae and Argiopidae, and perhaps wider than the ecological amplitude of any other superfamily of Araneomorpha.

Most recent authors regarded the family Agelenidae as being divided into two subfamilies, Ageleninae and Cybaeinae. According to a common practice derived from SIMON (1898 a), these groups are defined according to a single key-character – the relative length of the apical joint of the posterior spinnerets. The tables in this chapter reveal that this character is valueless for this purpose although it is of practical use in separating the well-known European genera *Agelena*, *Tegenaria*, and *Tetrrix*, from *Cybaeus*.

Alternative classifications of the family Agelenidae auct. have been proposed (F. O. PICKARD-CAMBRIDGE 1893, POCKOCK 1895, KISHIDA 1955, YAGINUMA 1960), but few of the later authors have accepted them.

Argyronetinae and Hahniinae were still kept in Agelenidae by SIMON (1898 a), and this practice has been followed even by some recent authors (e.g., LOCKET & MILLIDGE 1953). On the other hand, PETRUNKEVITCH (1933) removed them far away from Agelenidae by placing them in the branch Quadrostiatae. Later he consid-

ered them to constitute the superfamily Argyronetoidea (PETRUNKEVITCH 1958).

In recent times, Argyronetidae has usually been regarded as also including the genera *Amphinecta* and *Cambridgea* (ROEWER 1954 a), or even the whole subfamily Cybaeinae (KISHIDA 1930 and later Japanese authors), but these catalogues give no key-characters or other kind of definition of this family. As to the claim for monophylety of taxa, the uniting of Cybaeinae to Argyronetidae could be accepted as justification of this in the present classification, provided that the Cybaeinae were first delimited. It is only for the sake of continuity that a slightly divergent grouping has finally been used here.

The subfamily Stiphidiinae was created by DALMAS (1917), but he assigned it to Psechrinae, where it has subsequently been listed (e.g., ROEWER 1954 a, BONNET 1958 and 1959). The other genus, *Stiphidiellum*, which was originally placed there together with the type genus, has since been removed by FORSTER (1955 a). It is also worth mentioning that *Amarara*, a synonym of the type genus, was originally assigned to Dictynidae s. lat. by R. MARPLES (1959).

The family Psechrinae has generally been characterized by the presence of claw tufts, even by the authors who have included Stiphidiinae in it (e.g., PETRUNKEVITCH 1928, p. 19). On the other hand, the subfamily Stiphidiinae is often separated from Psechrinae on account of the lack of claw tufts (DALMAS 1917, PETRUNKEVITCH 1928, p. 37). Such contradictions are not rare in arachnological papers. Besides, the claw tufts of even the genus *Psechrus* are weakly developed, and fundamentally dissimilar from those of, for instance, Ctenidae and Sparassidae. Accordingly, the genus *Stiphidion* must be transferred to Amaurobioidea, while Psechrinae must be left outside. In any case, it is not a relative of Stiphidiinae (cf. Fig. 11).

Tengellidae was established as a family by F. DAHL (1908), but a synonym of the type genus, *Metafecenia*, has always been listed in Psechrinae: Psechrinae. PETRUNKEVITCH (1928) divided Tengellidae into two subfamilies – Tengellinae, including *Themacrys*, and Calamistrulinae for *Calamistrula* and *Mnesitheus*. He characterized this family by the presence of two rows of tarsal trichobothria and tarsal scopulae. However, there are no distinct trichobothria in the tarsi of *Themacrys*, and the development of scopulae of different strength is not

Table 8. Amaurobioidea: families.

	Miturgidae	Amaurobiidae	Liocranidae	Agelenidae	Dictynidae	Hahnidae
Size	very large – medium	very large – minute	large – small	very large – small	minute – large	minute – medium
Cribellum – colulus	cr: variable co: unpaired plate	cr: very variable co: unpaired (exc. <i>Tjurunga</i>)	co: unpaired hairy area	co: always paired	cr: variable co: always unpaired	co: usually strongly reduced (paired or unpaired)
Pattern of spinnerets	very variable	BP – moderately modified	BP	PS with $\pm$ lengthened distal segment	AS often distinctly separated, all spinner. often $\pm$ slender	all spinner. arranged in a single row, or at least a wide BP
Abdominal pattern	usually obscure BP	BP with minor modifications	BP	central $\pm$ parallel band – BP	BP or $\pm$ strongly modified	BP or <i>Dictyna</i> type
Trends of carapace modifications	shortening of cephalic area	–	–	ocular area protruding	reduction of fovea	reduction of fovea
Trends of cheliceral modifications	–	long groove & incr. of teeth	–	–	sexual dimorphism	reduction of armature
Leg spinulation	usually unmodified BP	BP or minor modifications	I: ventral sp. increased	BP	reduction of most spines	reduction of ventr. spines
Feathery hairs	absent – present	absent – present	present	present – absent	absent	absent
Trochanteral notch	usually distinct	usually absent	present	very seldom present	absent	absent
Calamistrum (in crib. spp.)	several regular rows or subbasal oval area	usually basal in one row	–	–	always in one row	–
Number of tarsal claws	2, sometimes 2 – 3 or 3	3	2	3	3	3
Tarsal claw tufts	continuous with scopulae	usually absent or indistinct	$\pm$ indistinct type	usually absent, seldom weak	practically absent	practically absent
Ventral scopulae	very dense – moderate	usually weak or absent	usually moderate or weak	absent or weak	usually absent	usually absent
Tarsal trichobothria	in 2 or 3 rows	BP – reduced to 1 – 2, exceptionally in 2 rows or irregular	in 2 $\pm$ irregular rows	BP	usually $\pm$ reduced BP	usually $\pm$ reduced BP
Modifications of palpal tibia and patella of σ	tibiae always armed with 1 – 2 processes, patella unarmed	tib. with variable processes, patella often unarmed	tibia with processes	tibia always, patella often with processes	tibia usually, patella seldom with processes	tibia always with one apical process, patella usually with basal hook
Embolus	often running between tegulum and cymbium; shape $\pm$ BP	BP – variously modified	BP – thickened and shortened	BP – variously modified	BP – variously modified	BP
Primary conductor	usually present	present – absent, apical – central	present: apical	present: apical – central	present: directed caudally	usually absent or, when present, caudal – central
Secondary conductor	usually present	usually present	present	«fulcrum» present: often morphologically analogous, but homology uncertain	always absent	always absent
Median apophysis	usually present (– $\pm$ reduced)	variable, seldom reduced	present	present or secondarily reduced	primarily absent	usually absent, but obviously always secondarily reduced
Epigynal structure	these organs afford numerous characters for phylogenetic analysis, but none of them is practical in comparing these large families					
The most useful characteristics in practice	size, tarsal modifications, calamistrum, course of embolus	– crib. species: prim. & sec. conductor, median apophysis, spinulation – crib. species: unpaired colulus, typical second. conductor, abdominal pattern	– within «Clubionidae» auct.: colour pattern, σ genital organs – within Amaurobioidea: 2 claws, feathery hairs, unpaired colulus	paired colulus, eye pattern, abdominal pattern, fulcrum	σ genital organs, spine pattern	pattern of spinnerets, σ general pattern of genital organs
Distribution	Southern hemisphere + tropical and subtropical zones of Northern hemisphere	world-wide	Holarctic, other probable areas $\pm$ unrevised	Holarctic – Ethiopian – Oriental – N. Neotropical	world-wide (? except Madagascar)	world-wide

rare in any of the groups of Amaurobioidea with large terricolous species.

The remaining genera of Amaurobioidea with strong scopulae and several rows of tarsal trichobothria were placed in the family Zorocratidae by F. DAHL (1913), but all other authors have placed them in Zoropsidae on account of the presence of two tarsal claws only. Thus *Raecius* has always been listed in Zoropsidae and its synonym *Mnesitheus* usually in Tengellidae (e.g., PETRUNKEVITCH 1928, ROEWER 1954 a, BONNET 1957 and 1959).

POCOCK (1895) created the family 'Desidae, but later authors, except ROTH (1967 b), have placed the genus *Desis* in the subfamily Cybaeinae in Agelenidae.

The facts presented above clearly show that a revision of some of the classical families only, without broad comparative analysis of related families, could not have resulted in even a partial phylogenetic classification of Amaurobioidea.

After a thorough study of the groups treated above as well as a more superficial one of their more distant relatives, I am inclined to confess that the limitation of taxa at family group level in Amaurobiides is more a matter of opinion than in any other group treated in this paper. According to the results of the present study, there are hardly any larger gaps in this enormous group with its remarkably deviating peripheral forms. Thus the adaptive radiation of Amaurobiides is still in rapid progress, and many of its subdivisions may be fairly young.

In such a morphologically homogeneous group the traditional names of as many taxa as possible may be taken into account in presenting the results of a revision, as there are several slightly different classifications based on a single pedigree. The current names for well-known taxa can, however, be regarded only as a choice from among several taxonomically equal possibilities.

To extend the rule of priority as far as the family level would have a great disadvantage especially in homogeneous groups. Usually a new higher taxon has first been proposed for a decidedly deviating adaptive modification of a large group (cf. *Matachia* and *Desis*). When this group is later revised, it should be named according to one of its most deviating, and thus peripheral, members. There is seldom a name available that refers to some of the genera with average characters of the revised group, and that also has priority over all other proposed names.

When the fundamental principles of the International Code for Zoological Nomenclature (1964) are followed, and when at the same time the highest possible stability in limiting well-known taxa must be taken into account, a rather strict limitation must be preferred in most cases above the specific level, when on account of the form of pedigree the limitation is a matter of opinion.

The superfamily Amaurobioidea is not defined here as a whole branch of spider evolution, but it is the basal part of such a branch, Amaurobiides, while there may be several minor branches originating among the ancestors of Amaurobioidea. A parallel case of limitation of a basal part of the same branch of spider evolution can be found in the last schema of PETRUNKEVITCH (1958). His Lycosoidea includes all the three-clawed spiders with three cardiac ostia that are here assigned to the branch Amaurobiides, while the rest of my Amaurobioidea are scattered among Thomisoidea and Clubionoidea in his division Dionycha, and among Argyronetoidea in his division Quadrostiatae.

When the highest possible stability of well-known groups is preferred to perfectly consistent standards of limitation of families throughout the order, the superfamily Amaurobioidea can be divided into six families, Miturgidae (n. fam.), Amaurobiidae, Liocranidae (n. fam.), Agelenidae, Dictynidae, and Hahniidae. My families Toxopidae, Anyphaenidae, as well as the deviating Cribellate families Psechridae and Titaenoecidae obviously also belong to the vicinity of Amaurobioidea as minor derivative branches.

The limitation of families accepted here for Amaurobioidea strives after the most probable monophylety and at the same time the separation of families, even according to juvenile specimens remains rather easy.

Another classification with equal phylogeny, but giving preference to consistent limitation of families, would lead to the splitting of Amaurobiidae, at least, while the lumping of Liocranidae with Miturgidae is not out of the question.

In such an exceptionally homogeneous group as Amaurobioidea several additional alternatives of classification might be almost equally justified. On the other hand, the families Agelenidae, Amaurobiidae, and Dictynidae as limited up till now, could no longer be accepted as taxa of any rank, because they are not monophyletic, i.e. they do not fulfil the primary condition (cf. Fig. 11).

An alternative classification would be:

Miturgidae (Machadoniinae, Uliodoninae, Miturginae, and Eutichurinae)	}	= Miturgidae
Tengellidae (Tengellinae)		
Amaurobioididae (Amaurobioidinae)		
Desidae (Desinae and Matachiinae)	}	= Amaurobiidae
Phyxelididae (Phyxelidinae)		
Amaurobiidae (Macrobuninae, Rhoicininae, Altellopsinae, Amaurobiinae, and Metal- tellinae)		
Stiphidiidae (Stiphidiinae)		
Liocranidae		
Agelenidae (Agelenidae and Coelotinae)		
Dictynidae (Cybaeinae, Litisedinae, Cicu- rininae, Tricholathysinae, Dictyninae)	}	= Dictynidae
Argyronetidae (Argyronetinae)		
Hahniidae (Cryphoecinae, Cybaeolinae, Hahniinae)		

The limitation of all the six Amaurobioidean families in this paper is radically different from all previous limitations of Amaurobiidae, Agelenidae, Dictynidae, and Hahniidae, nor do the new families, Miturgidae and Liocranidae correspond to any previously used concept of spider families. The new classification is argued in detail in connection with the description of these families later in this chapter.

There are several entirely new subfamily names in my classification, but this is not surprising as the corresponding groups usually consist of merely exotic species and genera.

The synonymic list of the accepted family-group names is as follows:

- Miturgidae n. fam. (Miturgini Simon 1885 – Drassidae)
 Tengellidae F. Dahl 1908
 Zorocratidae F. Dahl 1913 (= Tengellinae)
 Calamistrulinae Petrunkevitch 1928 (in Tengellidae)
 (= ? Uliodoninae)
 Amaurobioididae Hickman 1951
 Machadoniinae n. subfam.
 Uliodoninae n. subfam.
 Eutichurinae n. subfam.
- Amaurobiidae Thorell 1870 (-nae – Agelenoidae)
 Ciniflonidae Blackwall 1841 (obj. synon. of Amaurobiinae;
 officially invalidated)
 Desidae Pocock 1895
 Rhoicininae Simon 1898 (in Lycosidae)
 Matachiinae Dalmás 1917 (in Psechridae)
 Stiphidiinae Dalmás 1917 (in Psechridae)
 Myropsisinae Petrunkevitch 1928 (in Dictynidae)
 (= Macrobuninae, invalid because of homonymy of
 the type genus)
 Ixenticinae Petrunkevitch 1939 (= Matachiinae)
 Macrobuninae Bonnet 1957 (in Dictynidae)
 Phyxelidinae n. subfam.

- Altellopsinae n. subfam.
 Metaltellinae n. subfam.
- Liocranidae n. fam. (Simon 1897: -nae – Clubionidae)
- Agelenidae C. L. Koch 1837 (Agelenides)
 Coelotinae F. O. Pickard-Cambridge 1893
 Textricinae Homann 1950 (in Hersiliidae) (= Ageleninae:
 well-defined tribus)
 Textrichinae Kishida 1955 (independently in Agelenidae)
- Dictynidae O. Pickard-Cambridge 1871
 Argyronetinae Thorell 1870 (in Agelenoidae)
 Rhoidae Thorell 1873 (= Dictyninae)
 Cybaeinae Banks 1892 (in Agelenidae)
 Cicurininae F. O. Pickard-Cambridge 1893 (in Agelenidae)
 Litisedinae n. subfam.
 Tricholathysinae n. subfam.
- Hahniidae Bertkau 1878
 Cryphoecinae F. O. Pickard-Cambridge 1893 (in Agelenidae)
 Cybacolinae n. subfam.

The phylogeny suggested for families and subfamilies of Amaurobioidea is presented in Fig. 11. The limitation of Amaurobioidea as such is not difficult, but the internal structure of the schema may be slightly altered, as the evolution of some characters is not always undoubtedly consistent with the hypotheses that have been made for the compilation of Fig. 11. For instance, the development of a secondary conductor on the distal margin of the tegulum close to the ejaculatory duct is supposed to be both a secondary and a homologous structure within Amaurobioidea. Thus a species without a secondary conductor could represent either a primitive branch or a highly specialized group with secondary reduction of the secondary conductor. If the evolution of the secondary conductor is a false hypothesis, the essentials of the schema would be changed, but the correct placing of the superfamily Amaurobioidea, or any of the families delimited within it, is not dependent upon this hypothesis.

The present classification of Amaurobioidea is based on the following general principles of spider evolution.

Independent reduction through adaptation to similar circumstances or as a result of prevailing trends may concern any of the following characters, in any combination, and in any possible order: cribellum, spinnerets proper, unpaired tarsal claw, median apophysis and primary conductor of male palpus, lateral teeth of epigyne, feathery hairs, fovea, anterior median eyes or all eyes, number of cardiac ostia, of dorsoventral abdominal muscles, of leg spines and of tarsal trichobothria.

The following simple structures may have

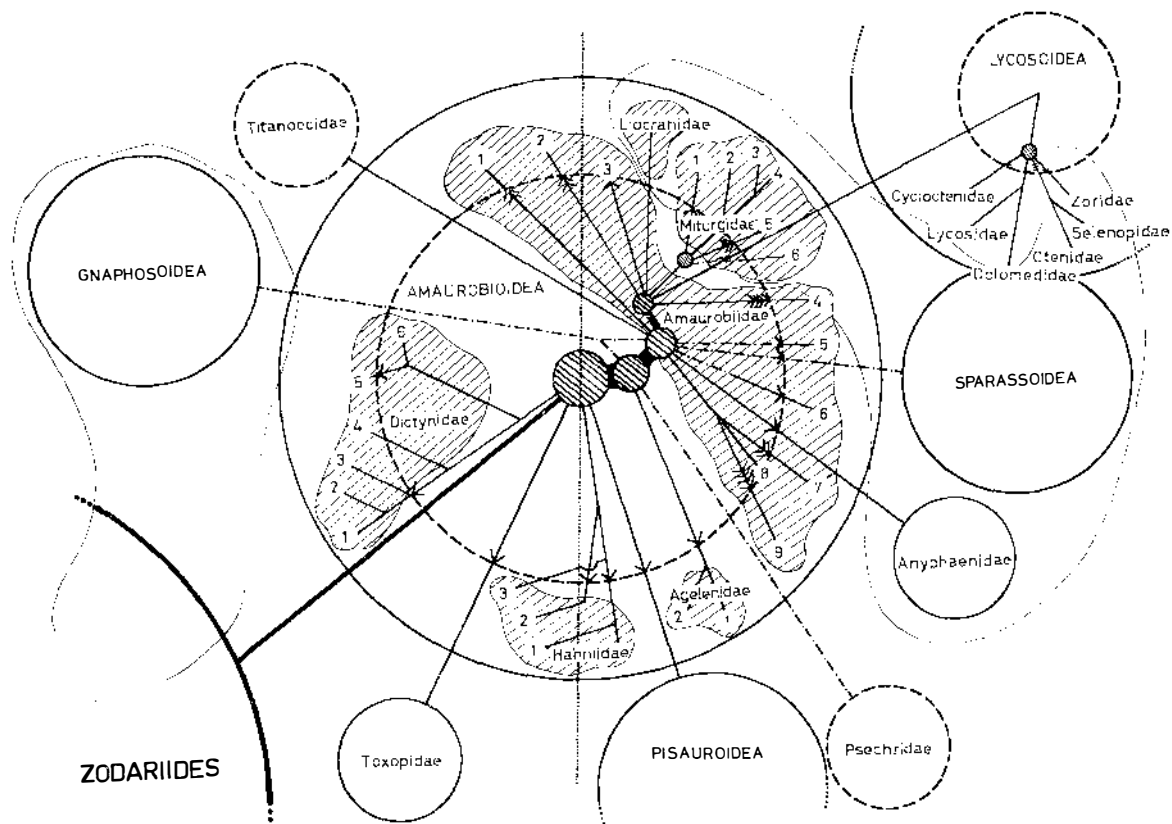


Fig. 11. Classification of Amaurobiides. Naming of taxa expresses the extent to which the present revision has been carried out. In the case of Amaurobiodea, the numbers refer to subfamilies revised as follows:

Miturgidae: 1 = Uliodoninae, 2 = Machadoniinae, 3 = Eutichurinae, 4 = Miturginae, 5 = Tengellinae, 6 = Amaurobioidinae.

Amaurobiidae: 1 = Stiphidiinae, 2 = Metaltellinae, 3 = Amaurobiinae, 4 = Macrobuninae, 5 = Rhoicininae, 6 = Altelopsinae, 7 = Matachiinae, 8 = Phyxelidinae, 9 = Desinae.

Agelenidae: 1 = Cocolotinae, 2 = Ageleninae.

Hahnidae: 1 = Hahninae, 2 = Cybaeolinae, 3 = Cryphoeccinae.

Dictynidae: 1 = Cybaeinae, 2 = Argyronetinae, 3 = Litisedinae, 4 = Cicurinae, 5 = Tricholathysinae, 6 = Dictyninae.

The evolution of some characters:

Broken circles: Cribellate species groups.

Number of arrows demonstrates the number of confirmed cases of the independent reduction of cribellum within a group, figured here by single lines.

Solid circles or rings: Ecribellate groups (outer ring of Amaurobiodea $\cong$ Agelenidae auct.)

Thin solid lines limit groups with two-clawed spiders; dotted points indicate groups in which independent reduction of the unpaired tarsal claw has been secured in more than one lineage ($\cong$ Clubionidae auct.)

Vertical dotted line: left side of Amaurobiodea – no median apophysis (there are some cases of secondary reduction even in the right side).

Small circle within Amaurobiidae: origin of secondary conductor.

Alternative dots and lines indicate phyletic relationships that are more or less tentative only.

been developed independently at least as adaptive structures: tarsal and metatarsal scopulae, tegular apophyses and modifications of various simple types (shortening, flattening, thickening, etc.) in embolus and primary conductor, increase in the number of cheliceral teeth and tarsal spines, simple changes in the shape and length of posterior spinnerets, displacement of

the site of tracheal stigma, epigynal plate, occurrence of any number of epigynal foveae, modifications of palpal patella and femur, adaptive modifications of maxillae and labium, and tracheal extension into the cephalothorax.

Any elaborate patterns without essential adaptive values have been considered as having originated only once. These are, e.g., the basic

pattern of colouration in Amaurobioidea as demonstrated in Figs. 42–57, the combined trichobothrial patterns of tibiae, metatarsi, and tarsi as they occur in unreduced form (Fig. 68), the unreduced pattern of male and female genitalia including median apophysis with articulated base, rigid conductor, semicircular embolus in male, and lateral teeth in female.

In the construction of my schema it has not been necessary to presuppose a single case of convergence in complicated structures. The number of characters studied has been large enough for a reliable placing of most of the genera of which both sexes have been described and available for study. On the other hand, several genera of which only the female has been described, have had to be placed more or less provisionally, or remained as *incertae sedis* (*Austrohahnia*, *Calamistrula*, *Callevopsis*, *Syro-risa*, and the fossil genera *Adamator*, *Eocryphoea* and *Eolathys*). Although both sexes have been available for the study of *Symposia*, it has remained as *incertae sedis* in Amaurobioidea.

The main argument for the radical reclassification of the Agelenidae – Amaurobiidae complex is the presence of numerous pairs of very closely related genera of Cribellate and Ecribellate spiders (*Maniho* – *Amphinecta*, *Forsterina* – *Namandia*, *Anisacate* – *Livius*, *Metaltella* – *Calacadia*, *Stiphidion* – *Tjurunga*, etc.). In these pairs the similarity extends to minor details of the male and female genital patterns as well as to a number of less complicated structures; in *Macrobnus*, both Cribellate and Ecribellate species have had to be included in a single genus.

The contradictions in the classification of Amaurobioidea which originate in the dissolving of the course of evolution of the cribellum cannot be avoided either by removing some genera from Agelenidae to Amaurobiidae and *vice versa*, or by simply uniting these two large families. If the latter course were followed, all the other families of Amaurobioidea would also have to be united to the resulting large family. Thus, to achieve at least some stability in the limitation of the families of this group, the only possible course is to apply some kind of subdivision other than the usual Cribellate – Ecribellate, to the classical Amaurobiidae – Agelenidae complex.

The Ecribellate members of Amaurobiidae, with the exception only of the single Ecribellate genus of Stiphidiinae (*Tjurunga*), can easily be

separated from any Agelenid genera on the basis of undivided colulus, as the Agelenid colulus is always of bipartite origin, no matter how vestigial it may be.

The phylogenetic relationships presented in the branches of the dendrogram of Amaurobioidea in Fig. 11 are not equally certain. Therefore, some explanatory notes must be given here.

The reduction of the median apophysis and the direction of the distal part of the primary conductor usually seem to be linked with each other, but this may only be due to mere chance in Stiphidiinae. In Hahniidae, there is a general trend towards reduction of the primary conductor and simultaneous development of an analogical groove at the margin of the cymbium; this combination is not restricted to Amaurobioidea.

The limitation of Agelenidae, Liocranidae, and Dictynidae is very easy in my schema, while some doubts remain about the monophyletic origin of Amaurobiidae, Miturgidae, and Hahniidae. Besides, the gap between subfamilies in different families is not always the same on an average, and some of the subfamilies of Amaurobiidae and Miturgidae will possibly be raised to familial rank by some later author, or even by myself, provided that additional information about them proves that they are independent branches of Amaurobioidean evolution. Furthermore, some of the genera listed here in Amaurobioidea as *incertae sedis*, obviously represent subfamilies whose naming could be justified.

The reciprocal relationships of the subfamilies in Fig. 11 do not necessarily correspond to the sequence of lines, but they have been arranged so as to make for the greatest distinctness in the figure.

A number of other genera have been placed provisionally only, as there has been no material available for study (*Cinifrella*, *Philoicides*, and *Tandil*). For similar reasons, the synonymization of *Aebutinoides*, *Notolathys*, *Opsaltella*, and *Paraltelopsis* must be checked according to the type material, when this becomes available.

Many fossil species which certainly represent undescribed genera have intentionally been left without generic names and final revision. The same is true for a few examples of recent species, because this kind of extensive work must have a time limit and there is always information on some details requiring further analysis, which may result in the creation of a new genus or even a higher taxon.

Basic pattern

As has been emphasized repeatedly in this paper, the species of the superfamily Amaurobioidea are fairly constant as regards general appearance and the numerous patterns peculiar to this group. Referring to the basic patterns of the whole group by the simple abbreviation BP is of great help in compiling key-tables, and especially in making the most practical use of them. In some genera or families, this basic pattern may have been radically modified, but this does not affect the general usefulness of such a concept. The following combinations of characters are supposed for the ancestors of Amaurobioidea:

Cribellum, three tarsal claws, lateral cheliceral condyle, tarsal trichobothrial pattern with distally increasing length of hairs, median apophysis as a separate sclerite, and primary conductor originating from the ventral face of tegulum (and not close to ejaculatory duct) in bulbus of the male palpus, thin and more or less circular embolus, lateral teeth in the epigynal area, anterior spinnerets conical and close to each other, fovea longitudinal, a few dorsal and prolateral femoral spines, 2–4 pairs of ventral and some dorsal and lateral spines on tibiae and metatarsi, no tarsal spines, eight eyes in two more or less straight rows, both margins of cheliceral groove with 2–5 teeth, feathery hairs, maxillae distally obtuse and laterally notched, labium notched basally, sternum widest at centre and gradually tapering towards the apex, and abdominal pattern of *Tegenaria* – *Pardosa* type (Figs. 47–50).

The limitation of other superfamilies of Amaurobioidea is outside the scope of this paper. Thus only some orientating notes on them are presented after the detailed discussion of Amaurobioidea.

Miturgidae

In most Amaurobioidea the original three-clawed armature of the tarsi has been preserved, although there is a general trend towards reduction of the web-spinning habit. On the other hand, there are numerous derivative groups, Sparassoidea, Gnaphosoidea, Anyphaenidae, etc., which are entirely composed of two-clawed species. Thus the reduction of the unpaired tarsal claw occurred independently several times during the evolution of Amaurobioidea.

Because of the exceptionally great homogeneity of Amaurobioidea as a whole, and because of the narrow range and small number of species in most of the two-clawed Amaurobioidean groups, it is rather difficult to create a well argued classification.

According to the present knowledge of these groups, the most practical alternative seems to be to separate the family Liocranidae and to treat the other groups preliminarily as a large family, Miturgidae. In any case, all subdivisions of my Miturgidae are derivatives of the ancestral stock of Amaurobioidea. Since some of the present subfamilies are certainly a result of parallel evolution, the splitting of Miturgidae is unavoidable.

Because the results of probable later splitting have to be taken into account, the naming of this rather large family has been a difficult task. The choice of the name Miturgidae is argued as follows: The tribus name Miturgini is the oldest available name of family category. On the other hand, all the family names that have sometimes been used for some genera of my Miturgidae in fact refer to highly deviating types (Tengellidae, Zorocratidae, and Amaurobioidea). Furthermore, most of my Miturgid species are of the same type in general appearance, i.e. very large size, strong scopulae, and lengthened posterior spinnerets. Now, if this family will later be split, the revised Miturgidae will, however, remain the largest monophyletic group.

The characteristics of my Miturgidae are summarized in Tables 8 and 9, but some additional comments are given here for separation of Liocranidae and Miturgidae. Typical Liocranid spiders are of the basic Amaurobioidean type in appearance, and thus they could be confused, at first sight, with typical Amaurobid, Agelenid, or even Lycosid species; the reduction of the unpaired tarsal claw is the only important difference.

On the other hand, almost all groups of Miturgidae have undergone considerable change of general appearance, including colour and hair patterns and modification of spinnerets. The exceptional course of the embolus, typical of both Uliodoninae and Tengellinae, may be due to parallel evolution only. On the other hand, this pattern of male genitalia is entirely absent in other groups of Amaurobioidea, and it is therefore evident that at least a common trend of palpal modification does exist between these subfamilies.

Table 9. Miturgidae: subfamilies.

	Machadoniinae	Uliodoninae	Miturginae	Tengellinae	Amaurobioidinae	Eutichurinae
Size	large – medium	very large – large	very large – large	very large – large	large – medium	large – very large
Cribellum – colulus	co: unpaired plate	cr: undivided, size variable, co: protruding plate strongly conical	co: unpaired hairy area – short plate rather long, cylindrical	cr: large bipartite (– nonfunctional) strongly conical	co: unpaired hairy area	co: unpaired plate (? <i>Paratyle</i> : paired knob) weakly conical – cylindrical
Anterior spinnerets	conical – weakly conical				conical	
PS: apic./basal segment	apic. segm. very short	$\frac{1}{4}$ – $\frac{1}{2}$	1 – 2	$< \frac{1}{3}$	$< \frac{1}{4}$	1 $\frac{1}{2}$ – 3
Median spinnerets	rather long and slender	short $\pm$ conical	as long as AS, cylindrical	variable	as long as AS, sub-cylindrical	rather long, cylindrical
Abdominal pattern	obscure BP (– BP)	none – obscure BP	obscure – light BP	white spots – none	BP with dark folium	obscure BP – BP
Shape of carapace	BP	BP – long oval	BP	BP – long pear-shaped	long, rounded subrectangular	BP
Ocular area and pattern	unmodified $\pm$ 2 rows	unmodified: 2 rows	unmodified: 2 rows	unmodified: 2 rows	all eyes on a common elevation: 2 rows	unmodified: 2 rows
Maxillae	dist. enlarged, laterally notched	laterally weakly notched	long oval, laterally convex	laterally weakly notched – straight	long, laterally strongly notched	long, laterally weakly notched
Labium	long truncate	long – as long as wide, truncate	variable, truncate	very long, notched – truncate	long, apex rounded	variable, distally truncate
Apex of sternum	obtuse angle	obtuse angle	abruptly narrowed + short point	obtuse angle – pointed	gradually tapering (margin undulate)	obtuse angle
Calamistrum (when present)	–	oval subbasal area	–	oval subbasal area – regular	–	–
Feathery hairs	present	absent	absent	absent	absent	absent
Spine pattern	BP (tib. usually with 4 v.)	BP (tib. usually with 4 v.)	BP	slightly increased BP	BP	BP
Tarsal trichobothria	2 rows	2 (– 3 irregular) rows	2 rows	2 – 3 rows	2 diverging rows (– 1 dense row)	2 $\pm$ irregular rows
Trochanterae	distinctly notched	usually with shallow notch	distinctly notched	distinctly notched	unnotched	distinctly notched
Tarsal claws	I – II: usually 3, III – IV 2 – 3	2 – 3 (unpaired claw $\pm$ reduced)	2	2	2	2
Claw tufts	variable, usually very weak	dense longitudinal	dense longitudinal	dense longitudinal	dense longitudinal	longitudinal – vertical
Cymbial modifications	variable weak modifications, sometimes deep lateral furrow	$\pm$ insignificant	usually with long lateral furrow	basolateral projection	inside of apex modified	basolateral projection
Tibial processes	1 – 2 rather simple	1 – 2 simple (often 1 ventral) variable	1 lateroapical	1 lateroapical	1 very long lateroapical	1 lateroapical
Embolus	thin circular – strongly modified lamina	usually concealed by tegulum or conductor	usually thin circular, rarely thickened	$\pm$ thin circular, running between tegulum and cymbium	thin circular, running as an oblique subapical coil	usually $\pm$ modified spine
Primary conductor	absent	present (– absent)	usually with 2 branches	present (complicated)	present	present
Secondary conductor	membranous	membranous (– reduced)	membranous	membranous	sclerotized	membranous
Median apophysis	variable	variable (– reduced)	usually quite narrow	hooked	reduced	variable
Epigynal plate	variable central septum	variable central septum	bifurcate – absent	central septum	subquadrangular	variable central septum
Lateral teeth	often distinct, pointed	obtuse lobes	obtuse lobes	obtuse lobes (– with pits)	obtuse lobes	obtuse lobes
Special characters	–	often gigantic in size	abdomen rather long and narrow	–	intertidal	–
Distribution	Ethiopian – S. Oriental	Malagasy – Australian – S. Ethiopian, † Baltic amber	world-wide in tropical and subtropical zones	N. Neotropical – S. Nearctic	Subantarctic and adjacent coastal areas	Neotropical – S. Nearctic (? + Oriental-Australian)

In the Cribellate representatives of Miturgidae the calamistrum proper is lacking, evidently as a result of secondary reduction during the course of evolution, while the pseudocalamistrum is greatly enlarged to form a similar oval or long area of densely spaced, coarse, but distinctly laminar hairs. A parallel evolution of the calamistrum by convergence has also occurred in Psecridae and in all Cribellate Lycosoidea. However, the calamistral patterns of the two latter groups distinctly deviate from those of Miturgidae.

Machadoniinae

Representatives of this distinctly limited new subfamily constitute an essential part of the cryptic spider fauna of South African forests (LAWRENCE, in litt.), at least, and they are probably distributed all over the Ethiopian and the Oriental regions. Unlike the other Miturgid subfamilies, Machadonine spiders are usually medium-sized, and they largely resemble the basic Amaurobioidean type. The structure of the male genital organs does not irrevocably refer to Miturgidae, but a relationship with Palearctic Liocranid spiders is also possible. The latter alternative is also supported by the presence of feathery hairs. On the other hand, the general pattern of the female genital organs in *Machadonia* and *Devendra* suggests relationship with Uliodoninae rather than Liocranidae, and the main distribution of Miturgidae and Liocranidae has been an additional argument for the placing of Machadoniinae in this paper.

The reduction of the unpaired tarsal claw can be traced in detail within this subfamily, and the correlated development of tarsal and metatarsal scopulae, claw tufts, and the altered pattern of tarsal trichobothria is perhaps better demonstrated within the range of variation of these characters in Machadoniinae than in any other group of spiders. The type genus, *Machadonia*, includes a large scale of variation of these characters, whose evolution is a direct consequence of adaptation to cryptic habits.

In *Phanotea*, the gradual adaptation to cave life is demonstrated by the evolution of numerous characters in the series *P. latebricola* – *P. simoni* – *P. peringueyi* – *P. natalensis*, including the length of legs and trichobothria, colour pattern, size of eyes, and lengthening of the straight, distal part of the paired tarsal claws. There is also a gradual series in the shape of the

colulus in these species of *Phanotea*, but I cannot find any reasonable argumentation for linking this character with the adaptive ones mentioned. Some of the above facts were also briefly discussed by LAWRENCE (1952 a, 1952 b).

The four genera included are compared in Table 10.

Uliodoninae

The Cribellate representatives of this new subfamily have generally been listed under Zoropsidae or Tenggellidae, while the Ecribellate type genus, *Uliodon*, has usually been listed in Ctenidae except by HICKMAN (1949) who placed it in Clubionidae. On the other hand, most of the species of that genus were first described under the generic name *Zora*.

The mutual relationship of *Uliodon*, *Uduba*, and *Zorodictyna* is undoubted, while the three remaining genera are included in Uliodoninae more or less provisionally. *Raecius* differs especially in the presence of feathery hairs, but also in size and the rather deviating structure of the male genital organs resembling those of Amaurobiidae. For *Calamistrula*, cf. also p. 220.

The typical genera of Uliodoninae represent the giant spiders among Amaurobioidea, and the genital organs are characterized by the exceptional course of the embolus in males.

It is possible that there are several undescribed genera and species of this subfamily in Madagascar, the main area of the true gigantic species of this group. The area inhabited by Uliodoninae is poorly known in regard to the spider fauna, and only additional data will reveal the final relationships of the six genera included in Table 11.

Miturginae

The limitation of genera in this compact group called tribus Miturgini (in Clubionidae: Liocraninae) by most authors since SIMON (1897) has not yet been stabilized, and therefore no key-table has been presented here for these genera. Cf. also the alphabetic list. The group is characterized by the long apical segment of the posterior spinnerets, a common pattern of male genital organs (often with lateral groove in cymbium), and by more or less distinct abdominal pattern resembling the basic pattern of Amaurobioidea.

Subfamily is a new status for Miturginae, constituting of *Diaprogapta*, *Miturga*, *Para-*

Table 10. Miturgidae: Machadoniidae. For *Parapostenus*, cf. p. 256 and LESSERT (1923).

	<i>Campostichomma</i>	<i>Devendra</i>	<i>Machadonia</i>	<i>Phanotea</i>
Figure	--	87, 91	89, 92	86 – 87, 90
Size	large – medium	medium – large	large – medium	large
Cribellum – colulus	co: semicircular	co: transversal plate	co: semicirc. – triang.	co: transv. – semicirc.
Anterior spinnerets	conical	weakly conical	conical	weakly conical
PS: apical segment	very small	very small	very small	very small
Abdominal pattern	BP	obscure BP	BP – obscure	obscure
Shape of carapace	high, pear-shaped	BP	BP	BP
Pattern of carapace	three light bands	three light bands	three light bands – none	none
Fovea	long and shallow	long and shallow	long and shallow	long and deep
Size of AM	< PM	< PM	< PM	variable, sex. dimorphism
Shape of MOT	long trapezoidal	trapezoidal	trapezoidal (length variable)	long rectangular
Cheliceral teeth	4 + 3	4 + 3	3 + 3	4 – 5 + 2 – 3
Labium	long truncate	long truncate	long truncate	very long
Apex of sternum	obtuse	obtuse	obtuse	obtuse
Feathery hairs	abundant	abundant	abundant	absent
Tib. & met. v. sp.	4 + 3	3 + 3	4 + 3	4 – 5 + 2 – 3
Tarsal & metatarsal scapulae	moderate	weak	I – II dense, III – IV weak	weak – moderate
Unpaired tarsal claw	I – IV: small ± straight	I – IV: curved toothless	I – IV: ± reduced (– III – IV: absent)	I – IV: strongly reduced – absent (paired claws long)
Tarsal trichobothria	very long, in 2 rows	2 rows	2 rows	very long, in 2 rows
Trochanteral notch	deep	deep	deep	deep
Cymbial modifications	lateral deep furrow, blunt apex, and sub-apical excavation	shortened apex, long hairs on ectal margin	dorsal subapical oval scapula + short apex	basolateral blunt projection + short apex with scapula
Tibial processes	1 long apical + 1 compl. v. basal	1 apical + subapical basal	1 – 2 apical central – subapical	1 small apical subapical
Origination of embolus	thin circular coil with basal bulb	folded falciform	distally tapering curved spine	large folded lamella
Shape of embolus				
Primary conductor	absent	absent	absent	absent
Secondary conductor	subcentral membranous	distal membranous	long distal membrane	long distal membrane
Median apophysis	scoop-shaped	complicated lamella	complicated lamella	falciform
Tegular apophysis	short subbasal	none	none	none
Epigynal plate	caudal transversal, indistinctly limited	central wide plate	longitudinal plate	central plate with anterior depression
Lateral teeth	absent	distinct caudal	pointed caudal – subcentral	lateral lobes
Special characters	–		–	♂ legs very long
Distribution	Ceylon	Ceylon	S. Ethiopian	S. Ethiopian

syrisca, *Prochora*, and *Syrisca*. The group is widely distributed in the Old World, and at least *Syrisca* is also represented in the Neotropical region.

Tengellinae

My *Tengellinae* is not identical with the generally accepted family *Tengellidae* that has been characterized by the trichobothrial pattern typical of almost the whole family *Miturgidae*, and also of several other groups of *Amaurobioidea* with two tarsal claws. Nor was the limitation of *Tengellidae* by F. DAHL (1908) and PETRUNKEVITCH (1923) identical.

PETRUNKEVITCH (1933) later created his new schema of classification without personal acquaintance with any of the genera included by him in *Tengellidae*. F. DAHL (1913) created his *Zorocratidae* for some of the genera that are here included in *Tengellidae*, while most authors have continued to list them in *Zoropsidae*. Furthermore, *Metafecenia* has always been listed in *Psechridae*, evidently an account of the similar structure of the calamistrum.

Tengellidae was divided into two subfamilies, *Tengellinae* and *Calamistrulinae*, by PETRUNKEVITCH (1928), possibly on grounds presented by F. DAHL (1901 b). Close relationship between *Mnesitheus* and *Calamistrula* was doubted by

Table 11. Miturgidae: Uliodoninae.

	<i>Uduba</i>	<i>Zorodictyna</i>	<i>Uliodon</i>	<i>Raecius</i>	† <i>Adamator</i>	<i>Calamistrula</i>
Figure	80 – 81, 84	72, 76, 78	L. Koch (1873, pl. 34)	58, 73, 85	PETRUNKEVITCH (1942)	77
Size	very large	very large	very large	large	large	large
Cribellum-colulus	cr: small undivided	cr: small undivided	co: protruding hairy plate	cr: large undivided	cr: large undivided	co-cr: semicircular
Anterior spinnerets	strongly conical	strongly conical	strongly conical	strongly conical	strongly conical	long subcylindrical
PS: apic./basal segment	very small	very small	very small	$\frac{1}{2}$	$< \frac{1}{2}$, tapering apex	$\frac{1}{2}$
Abdominal pattern	none	obscure	obscure BP	obscure	?	none
Shape of carapace	long oval	long oval	pear-shaped	long oval (narrow)	long oval	long oval
Pattern of carapace	none	none – 2 light bands	none	none	?	none
Fovea	short and shallow	long and deep	long	very long, rather deep	long and deep	long and shallow
Size of AM	subequal to PM	$\geq$ PM	subequal to PM	subequal to PM	$>$ PM	$<$ PM
Shape of MOT	quadrangular	variable	long rectangular	quadrangular – long rectang.	trapezoidal	quadrangular
Cheliceral teeth	3 + 3	3 + 3	3 + 2 – 3	2 – 3 + 3	?	3 + 3
Labium	very long, notched	long truncate	long, distally notched	long notched	long truncate	long truncate
Apex of sternum	obtuse	obtuse	obtuse angle	obtuse	shortly pointed	shortly pointed
Feathery hairs	absent	absent	absent	scarce	absent	absent
Tib. & met. v. sp.	3 + 3	2 – 4 + 3 – 4 ($\pm$ irreg.)	4 + 3	4 – 3 + 3 ($\pm$ irregular)	4 + 1 (?)	4 + 3
Calamistrum	strongly reduced	basal, in 3 irreg. rows	–	basal oval area (pseudocal.)	basal (?) uniseriate)	basal oval area
Tarsal & metat. scopulae	well developed and dense	moderate	well developed and dense	well developed and dense	I – II well developed	moderate
Tarsal claws	I – II: $\pm$ reduced IV: absent	I – II: minute, III – IV: reduced – absent	totally reduced	I – II: $\pm$ reduced, III – IV: absent	IV: absent (?)	I – IV: well developed curved, but toothless
Tarsal trichobothria	2 rows	2 irregular rows	three apical $\pm$ irregular rows	2 rows	long (?) pattern)	2 rows
Trochanteral notch	shallow	shallow – indistinct	distinct	indistinct – absent	indistinct	shallow
Cymbial modifications	marginal excavations and distal scopula	weak subbasal boss	apex short, with inner furrow + subbasal boss	distal scopula + slightly modified base	δ unknown	δ unknown
Tibial processes	1 subapical + 1 hairy ventr.	2 small apical	1 branched small apical	1 subapical + 1 ventral		
Origination of embolus	central (running under teg.)	central	subbasal – central	central		
Shape of embolus	thin circular coil with basal bulb	thick curved spine	thin spine ($\pm$ totally behind conductor)	distally dilated lamina with thick basal part		
Primary conductor	thick distal projection of teg. with membr. marg.	large concave plate	thick longitudinal lamella	absent		
Secondary conductor	totally reduced	wide membrane	membranous	distal membranous		
Median apophysis	short and thick	curved	minute – reduced	large scoop-shaped		
Tegular apophysis	long and thick lateroapical	none	basal part of teg. protrud- ing	large obtuse subbasal		
Epigynal plate	quite variable	wide ant. with notched caudal margin	hairy central septum	longitudinal plate with shallow depression	?	caudal transversal
Lateral teeth	indistinct – none	thick caudal lobes	obtuse caudal lobes	lateral lobes	?	rounded projections with deep pit
Special characters	inner face of cymbium acts as a functional conductor					cribellum and calami- strum become reduced before adult stage
Distribution	Malagasy	Malagasy	Australian	N. & C. Ethiopian	† Baltic amber	Malagasy

Table 12. Miturgidae: Tengellinae¹.

	<i>Tengella</i>	<i>Zorocrates</i>	<i>Titiotus</i>
Figure	75, 83	74, 79, 82	SIMON (1897, Fig. 97)
Size	large	very large – large	very large – large
Cribellum - colulus	cr: large bipartite	cr: large bipartite	co: variable in shape
Spinnerets	thick BP	thick BP	thick BP
Abdominal pattern	two rows of small white spots	light anterior folium	none – anterior folium
Shape of abdomen	long oval	oval	oval
Shape of carapace	long pear-shaped, cephalic area long and narrow	pear-shaped	pear-shaped
Fovea	long and deep	long and rather deep	long and distinct
Size of AM	> PM	> PM	subequal to PM
Shape of MOT	quadrangular	long rectangular	long, subrectangular
Cheliceral teeth	4 – 5 + 3	3 + 3	3 + 2 – 3
Labium	very long, distally notched	long, distally truncate	long, truncate
Apex of sternum	pointed	obtuse angle	shortly pointed
Tib. & met. v. sp.	3 – 4 + 3 – 4	4 + 3	5 + 3
Tarsal trichobothria	2 rows	3 rows	2 rows
Trochanteral notch	deep	I – II: shallow, III – IV: deep	distinct
Calamistrum	subbasal in 5 rows	subbasal oval area (pseudocalamistrum)	
Cymbial modifications	basal projection	basolateral dilatation	insignificant
Shape of palpal tibia	long cylindrical	short ± cylindrical	long cylindrical
Tibial process	apical spur + ventral tuft of long hairs	hooked subapical spur	simple lateroapical
Origination of embolus	inside tegulum centrally	inside tegulum basally	mesal face of tegulum
Course of embolus	freely in a large cavity between tegulum and cymbium	along the inner surface of cymbium	longitudinal visible
Shape of embolus	thick lamella	thin semicircular	thick modified lamella
Primary conductor	strong folded lamella with branched apical part	large and complicated lamina	fused to embolus
Secondary conductor	wide membrane	long and thin membranous fold	distal membranous
Median apophysis	very long with apical hook	short hooked	long, distally modified
Tegular modifications	finger-shaped process between the caudal part of tegulum and subtegulum	basally protruding, inner face with shallow tubercles	subbasal mesal boss
Epigynal plate	central, ± rounded septum	anterior, ± trapezoidal	central hairy septum
Lateral lobes	none	well developed with fovea	± weakly defined
Special characters	♂ with very long legs	–	
Distribution	N. Neotropical	N. Neotropical – S. Nearctic	S. Nearctic

¹ *Lauricius* and *Liocranoides* also belong here.

TULLGREN (1902), who placed *Mnesitheus* close to *Tengella*. The taxonomic position of *Calamistrula* cannot be finally settled until a male of this genus has been found.

The genus *Titiotus* represents a further instance of intermediate species between the Cribellate and the Ecribellate spiders. The cribellum of its generotype is still bipartite and of the same shape as, e.g., in *Zorocrates*, but obviously nonfunctional.

PETRUNKEVITCH (1923, p. 162) severely criticized the separation of Zorocratidae from Zoropsidae, but his opinion was mainly based on the supposed monophyly of two-clawed spiders, and there seem to be no affinities between *Zorocrates* and the Cribellate groups of Lycosoidea.

Amaurobioidinae

The well-known Circumantarctic littoral species, *Amaurobioides maritima*, has been included either in Clubionidae or in Ctenidae, except by HICKMAN (1949, 1951), who created the family Amaurobioididae. Later FORSTER (1955 a) transferred *Pacificana* from Agelenidae into Amaurobioididae. I agree with this limitation, but the status and position of this group seem to be unclear. It is provisionally listed here as a subfamily of Miturgidae, and the presence of a secondary conductor in the male palpus combined with the slightly modified basic eye pattern of Amaurobioidea might be a sufficient argumentation for such an opinion.

The adaptation to the intertidal zone is strongly reflected in most external characters of Amaurobioidine species, as well as, e.g., in the distribution of tracheae (cf. HICKMAN 1949).

Eutichurinae

In the Neotropical region there are several Miturgid spiders with very long posterior spinnerets that seemingly are not closely related to Miturginae. The limitation of this new subfamily, Eutichurinae, is still rather obscure, and it is probable that there are even some genera in the Old World, e.g., *Hebrithale*. Therefore no key-table of this group is presented here.

The following Neotropical genera seem to be closely related to each other, and they constitute the confirmed contents of my Eutichurinae: *Eutichurus*, *Philisca*, *Radulphius*, and *Strolarchus*.

Amaurobiidae

Various opinions on the definition and limitation of Amaurobiidae have been discussed above on pp. 308 – 311. My Amaurobiidae differs from all previous limitations in principle, because both Cribellate and Ecribellate species and genera are included. Even most of the subfamilies of my Amaurobiidae share this feature.

The Amaurobid spiders are easily separated from Dictynids by the presence of the median apophysis in the male palp, although this structure is sometimes entirely reduced (*Stiphidion*, *Porteria*, *Corasoides*, etc.). On the other hand, none of the classical characters for the separation of these two families can be used, as they are all correlated to the average size only (spinulation, trichobothrial pattern, maxillae, eyes). Ecribellate Amaurobid species are easily separated from any true Agelenids on account of the structure of the colulus, which is unpaired in all known Amaurobid species except the only Ecribellate Stiphidine species, *Tjurunga paroculus*, and even in this case the colulus is entirely different in structure.

In order to facilitate the appropriation of the fundamentally altered concept of Amaurobiidae, the treatment of ROEWER's (1954 a) undivided Amaurobiidae is summarized below. His 29 genera are here distributed as follows (synonyms in brackets):

Amaurobioidea

Amaurobiidae Matachiinae: [*Aphyctoschaema*], *Badumna*, [*Dexema*], *Epimecinus*, [*Hesperauximus*], [*Ixeuticus*], and *Phryganoporus*

– Desinae: *Syroris* and *Taurongia*
 – Phyxelidinae: [*Amphiggrioides*], [*Haemilla*], and *Phyxelida*
 – Macrobuninae: *Auximella*, *Macrobunus*, *Pimus*, *Zanomys*
 – A tellopsinae: *Tugana*
 – Amaurobiinae: [*Alauximus*], *Amaurobius*, *Callioplus*, *Callobius*, and *Walmus*
 Dictynidae Dictyninae: *Callevophthalmus*
 – Cicurinae: [*Auximus*] (genotype only)
 Incertae sedis: *Callevopsis*
 Titanocidae: [*Aymarella*], [*Calleva*], *Nurscia*, and *Titanoeca*

The contents of the »dump» genera *Amaurobius* and *Auximus* as catalogued by ROEWER have been discussed in detail in Chapter III, but it is worth mentioning here that *Amaurobius* used also to include several species that are now placed in the families Agelenidae and Corinnidae together with most of the groups listed above. LEVI & KRAUS (1964) still considered *Amaurobius* to be world-wide and rich in species.

My Amaurobiidae includes 71 valid genera, divided into nine subfamilies as follows (Table 13):

Matachiinae	(10)	Macrobuninae	(16)
Desinae	(16)	Altellopsinae	(5)
Phyxelidinae	(6)	Metaltellinae	(4)
Stiphidiinae	(3)	Amaurobiinae	(7)
Rhoicininae	(3)	Incertae sedis	(1)

A further comparison with ROEWER's catalogue reveals that the present Amaurobid genera that were known then, were divided into seven different families:

Amaurobiidae (15): see above

Dictynidae (8): *Altellopsis*, *Anisacate*, *Cinifella*, *Lathyarcha*, *Metaltella*, *Neuquenina*, *Pseudauximus*, and *Retiro*

Psechridae (3): *Matachia*, *Paramatachia*, and *Stiphidion*

Tengellidae (1): *Themacrys*

Agelenidae (14): *Barrisca*, *Cambridgea*, *Cedicus*, *Chresiona*, *Cicirra*, *Corasoides*, *Desis*, *Emmenomma*, *Myro*, *Neoporteria*, *Ommataxesis*, *Porteria*, *Rhoicinaria*, *Rhoicinus*, and *Rubrius*

Argyronetidae (2): *Amphinecta* and *Gohia*

Pisauridae (1): *Xinguisiella*

Later, new genera that are here included in Amaurobiidae, were described in Dictynidae (*Maniho* and *Oramia*), Agelenidae (*Gaspasia*, *Huara*, *Livius*, *Naevis*, *Olybrius*, *Urepus*, and *Virgilus*), and Pisauridae (*Calacadia*). Besides, sixteen new Amaurobid genera are created here. Synonymic names have not been taken into account in the two above lists, but the details are available in Chapter III.

Table 13. Amauro-

	Matachiinae	Desinae	Phyxelidinae	Stiphidiinae
Size	very large – small	very large – small	large – medium	medium – large
Cribellum – colulus	cr: usually bipartite – co: unpaired variable	co: semicircular thin – thick cr: bipartite	cr: ♀ distinctly bipartite, ♂ ± indistinctly bipartite	cr – co: paired
Abdominal pattern	usually BP	usually modified or none	BP – obscure	central light band
Structure of chelicerae	usually unmodified with a few (2 + 3) strong teeth	usually long, groove oblique, ± directed forward	♀ ± unmodified, ♂ longer and often with small modifications	armature very variable (cf. Table 17)
Apex of sternum	usually distinctly pointed	very variable	± right angle	pointed
Feathery hairs	absent	seldom present	absent	usually quite abundant
Leg spinulation	BP	often considerably reduced	± irregular, ♂ metatarsi with strongly modified spine patterns	BP – irregular
Tarsal trichobothria	BP (– 3 short)	BP or 2 rows or indistinct basal	absent (– short indistinct) subapical	BP subcentral – subapical
Calamistrum (when present)	basal – very long			
Trochanterae	usually unnotched	very variable	practically unnotched	unnotched – notched
Palpal tibial processes of ♂	1 – 4 lateral + ventr. carina	1 – 5 apical	1 – 2 rounded lobes, the larger with variable modifications	1 – 2 apical lamellae
Embolus	usually thin s-shaped spine	± circular (– curved spine)	± coiled thin spine (– lamella)	semicircular – curved spine
Primary conductor	present (distally directed)	usually distal plate	present (mesially directed)	obviously absent
Secondary conductor	absent	absent (–? present)	absent	absent
Median apophysis	present	present (– absent)	present	present – absent
Epigynal structure	very variable	very variable	unpaired plate present	variable
Lateral teeth	usually present	often present	absent	absent
Vulval structure	complicated	rather simple – complicated	rather simple	rather simple
Special characters	sometimes adapted to living in insect burrows in twigs of trees	often adapted to living in the intertidal zone	base of palpal femora with a stridulatory organ com- posed of sinuous thorns; ♂ metatarsi strongly mod- ified	umbrella-shaped web
Distribution	Australian – E. Oriental	Southern hemisphere (mainly coastal & Australian)	Ethiopian – E. Mediterra- nean	Australian

The Amaurobiid spiders naturally fall into two different groups according to the structure of the male palpi. There is no secondary conductor in Matachiinae, Desinae, Phyxelidinae, and Stiphidiinae, while that structure is well developed in Macrobininae, Metaltellinae and Amaurobiinae. The homology of *Rhoicinaria*'s conductor could not be interpreted with certainty, and thus the position of Altellopsinae is somewhat uncertain (cf. Fig. 11).

It is obvious that Amaurobiidae is a very old group, and that several families (Miturgidae, Liocranidae, and Anyphaenidae), and at least one large superfamily, Lycosoidea, are direct derivatives of some ancient branches of Amaurobiidae.

Matachiinae

The subfamily name Matachiinae was first used by DALMAS (1917) for two widely deviating genera, *Matachia* and *Paramatachia*, that have been adapted to an exceptional environment, the holes made by some wood-boring caterpillars (B. MARPLES 1962). This subfamily was even assigned to Psechridae, which is here transferred rather far from Amaurobiidae. The name Ixeuticinae was proposed by PETRUNKEVITCH (1939 a) for the Amaurobiid genera with a single row of hairs on the calamistrum. Unfortunately, 1) the generic name *Ixeuticus* is here synonymized, 2) this subfamily has never been distinctly limited or redefined, 3) the name has

idae: subfamilies.

Rhoicininae	Macrobuninae	Altellopsinae	Metaltellinae	Amaurobiinae
medium – large	large – minute	small – medium	medium – very large	very large – small
co: large unpaired	cr: usually bipartite – co: $\pm$ semicircular un- paired	cr: small undivided co: triangular	cr: usually bipartite, co: large triangular	cr: ♀ bipartite, ♂ usually $\pm$ reduced
obscure BP	BP – light BP	obscure – simple BP	$\pm$ distinct BP	$\pm$ distinct BP
$\pm$ unmodified	chelicerel groove long and armed with numerous teeth	weak, armature variable	$\pm$ unmodified, armature variable	$\pm$ unmodified, armature 2 + 3 – 4 + 5
pointed	very variable	$\pm$ rounded	pointed	pointed
absent BP	absent BP – v. rows of spines (I)	absent often somewhat reduced	absent BP	absent BP
irregular in ca. 2 rows	BP basal	1 – 3 basal	BP basal	BP basal + pseudocalamistrum
notched	usually unnotched	unnotched – weakly notched	wide or deep notch	practically unnotched
weakly defined apical lobe	lateroapical excavation with variably armed margins	1 small lateroapical	1 – 2 (apical and/or basal)	usually 2 lat. + 1 ventral
thin spine	arched lamella – S-shaped	thick	thin coiled	thick $\pm$ modified lamina
partly fused to embolus	variable distal – central	? homology uncertain	present (embracing em- bolus)	absent (– present)
present	present	? homology uncertain	present (not membra- nous)	present
present	present (– $\pm$ totally reduced)	absent	totally reduced	present
protruding caudal margin	very variable	caudally notched plate	indistinctly limited plate	$\pm$ trapezoidal thick plate
absent numerous secondary receptacula	seldom distinct very variable	absent simple with large receptacula	long falciform – absent complicated – simple	thick lobes – indistinct simple
ocoon carried by spinnerets	basal segments of palpus or I leg someti- mes with spurs or stri- ulatory organs	abdomen long oval	palpal patella usually modified	–
N. & C. Neotropical	Neotropical – S. Ethiopian, W. Nearctic – N. Palearctic	Neotropical	S. & C. Neotropical	Holarctic – N. Neotropical

not been generally used, and 4) Matachiinae has priority for that group of spiders. Thus I cannot recommend the use of the name *Ixeuticinae*, even if the synonymization of *Ixeuticus* is not acceptable to some later author.

Ixeuticinae was originally created in a schema of classification serving as a preliminary index to a catalogue (PETRUNKEVITCH 1939 a). The corresponding part of the catalogue was never published, and thus we do not know whether he had some additional argumentation for the division of Amaurobiidae. I am inclined to believe that he made this proposal mainly for practical reasons, especially as he had already written (PETRUNKEVITCH 1928, p. 37): »The number of genera belonging to this family is not suf-

ficient to warrant their separation into different subfamilies even though some of the characters would be considered as satisfactory for the purpose. I think, however, that the time will come when with the increase in described species the establishment of at least one additional subfamily will be desirable».

The subfamily Matachiinae as limited in Table 14 is the dominant group of spiders in the Australian region and Indonesia in the niches occupied anywhere by the Amaurobid – Agelenid type. Both Agelenidae and typical Holarctic Amaurobid subfamilies are almost totally lacking in these areas. This fact is not surprising when we remember the isolated evolution of the Australian representatives of some

Table: 14. Amauro-

	<i>Oramia</i>	<i>Lathyarcha</i>	<i>Badumna</i>	<i>Phryganoporus</i>	<i>Namandia</i>
Figure	43 & FORSTER (1964a)	98, 103	42, 59, 99 – 101, 104	102, 109	111
Size	large – medium	medium	very large – small	medium – large	medium
Cribellum – colulus	cr: small bipartite	cr: bipartite	cr: bipartite	cr: bipartite	co: transversal plate
Abdominal pattern	distinct BP	simple BP – none	BP (– obscure)	distinct light BP	light BP
Shape of carapace	BP	oval BP	BP	BP	high BP
Shape of chelicerae	short normal	short normal	normal	normal	groove oblique
Cheliceral teeth	2 + 3	2 + 3	2 + 3 – 4	2 + 4 (one very large)	2 + 3
Size of AM	< PM	subequal to PM	> PM (sex. dimorphism)	subequal to PM	subequal to PM
Shape of MOT	long ± rectangular	strongly trapezoidal	long (quadr. – trapez.)	long trapezoidal	wide rectangular
Fovea	long narrow	± circular pit	long – moderate, narrow	short narrow	short narrow
Labium	long truncate	very wide rounded	variable	as wide as long, truncate	as wide as long, truncate
Apex of sternum	pointed	widely obtuse	pointed	pointed	shortly pointed
Tib. & met. v. sp.	3 + 3	1 (– 2) + 2 – 3	2 (– 3) + 3	2 + 4	3 + 3
Tarsal trichobothria	BP	BP (3 short)	BP	BP	BP
Trochanteral notch	absent	absent	absent	absent	shallow
Shape of ♂ palpal tibia	cylindrical	♂ not available	± cylindrical – trapezoidal	short trapezoidal	short trapezoidal
Tibial processes	2 – 4 apical & central		2 – 3 apical + v. carina	1 basolateral	3 lateral + v. carina
Patellar processes	none		none	1 small dorsal	none
Origination of embolus	subapical		basal	basal	central
Shape of embolus	short curved spine		s-shaped spine	s-shaped spine	long and thin, circular
Conductor	complicated sub-apical lamella		distally tapering, with marginal furrow	distally tapering, marginal furrow	semicircular membranous plate with folded margin
Median apophysis	long and narrow		spoon-shaped	spoon-shaped	spoon-shaped
Tegular modifications	ejaculatory duct very thick		basally protruding	basally strongly protruding	flat
Epigynal foveae	insignificant	paired anterior	paired – unpaired anter.	unpaired anterior	♀ unknown
Epigynal plate	indistinctly limited	indistinctly limited	transversal bar	caudal transversal bar	
Vulval structure	simple	complicated	simple – rather complicated	simple	
Seminal receptacula	large oval	globular	globular	globular	
Lateral teeth	strong caudal	small subcaudal	variable central – subcaudal	small subcaudal	
Special characters	–	I – II patellae with 2 small circular pits ventrally; body flattened	large infraspecific variation in size and genitalia	social web	carapace and sternum with distinct pattern
Distribution	Subantarctic Australian	Australian	Australian – E. Oriental + synanthr. cosmopolitan	Australian	Australian (Tasmania)

well-known groups of animals, e.g., mammals. As the closest relatives of the Australian marsupials are found in Didelphidae and related families of the Neotropical region, so the mainly Neotropical subfamily Macrobonidae is phylogenetically close to Matachiinae.

According to FORSTER (in litt.), there are numerous undescribed genera and species of the Amaurobid – Agelenid type in New Zealand, at least. His unpublished figures show that there are also genera which are rather loosely related to those already described. Many of them represent small species, which are poorly known in any exotic area. A well-defined tribe is composed of following genera: *Badumna* – *Cicirra* – *Namandia* – *Forsterina* – *Phryganoporus* – *Matachia* – *Paramatachia*; the remaining genera

are either more distant relatives of some of the genera above or insufficiently known for final placing.

The genera *Matachia* and *Paramatachia* have already been transferred from Psechridae to the vicinity of *Ixeuticus* (= *Badumna*) by B. MARPLES (1962), mainly because of similarities in the male palpal organs. The placing of the fossil genus *Eomatachia* by PETRUNKEVITCH (1942) is surprising. In my opinion, it is the most typical representative of Amaurobiidae: Amaurobiinae.

Desinae

The limitation of this subfamily is far more difficult than that of any other subfamily of

idae: Matachiinae.

<i>Forsterina</i>	<i>Epimecinus</i>	<i>Cicirra</i>	<i>Paramatachia</i>	<i>Matachia</i>
105 – 107, 110	108	115	B. MARPLES (1962)	116; B. MARPLES (1962)
medium – large	small – medium	small	medium	medium – large
cr: bipartite BP (– obscure)	cr: bipartite BP	co: reduced to setae simple BP	cr: undivided distinct light BP	cr: undivided distinct light BP
BP groove ± oblique 2 (– 4) + 4 – 6 variable	BP groove oblique 2 widely separated + 5 – 6 < PM	oval BP normal 2 + 3 equal to PM	± semicylindrical very long, stretched 2 + 3 – 4 subequal to PM	± semicylindrical very long, stretched 0 – 2 + 4 < PM
long rectang. – quadrang. variable narrow ~ as wide as long, truncate pointed	trapezoidal short long truncate long pointed	quadrangular short as wide as long, truncate widely truncate	± quadrangular very short long truncate pointed	long trapezoidal short very long, truncate pointed
3 + 3 BP distinct	3 + 3 BP distinct	2 + 3 BP (3) absent	1 + 3 BP absent	2 + 3 BP absent
trapezoidal 2 lateral + carina ventral basal – subbasal -shaped spine	♂ unknown	♂ unknown	variable 2 apical + v. carina variable basal long and thin, semicircular	trapezoidal 2 apical + v. carina none median – subbasal long and thin, circular
distally forked, with marginal furrow			variable (apex acute or screwed)	semicirc. membr. plate with folded margin & distal spine
distally bent lamina indistinct			short acute insignificant	long and thin, strongly bent flat
usually insignificant indistinctly limited	unpaired longitudinal indistinctly limited	indistinct indistinctly limited	indistinct (anterior) indistinctly limited	indistinct indistinctly limited
simple	simple	simple	complicated	rather complicated
large globular small subcaudal – caudal	globular short subcaudal	oval rather long caudal	globular absent	globular short caudal
		--	abdomen cylindrical; well- developed clypeal triangle; calamistrum exceptionally long (4/5 of IV mt).	abdomen cylindrical; tracheal distribution variable
Australian	Australian	Australian (Tasmania)	Australian	Australian (New Zealand)

my Amaurobiidae. However, most of the sixteen genera (Table 15) seem to be derivatives of Matachine ancestors; the secondary conductor of the male palp is never present. There is a general trend towards reduction of the median apophysis. However, the derivation of Dictynidae and Hahniidae from Desinae is almost impossible because of the highly specialized types of male palpi in Desinae when compared with the simple basic type of Dictynidae and Hahniidae.

There are some well-defined groups in my Desinae, which could be called tribes. The tribe Desini consists of *Cedicus*, *Cambridgea*, *Desis*, *Gohia*, and *Huara*; as a whole it is an instance of adaptation to the intertidal zone. At least some of the species of *Cedicus* are strictly ter-

restrial, while the remaining genera are confined to the littoral zone, and all the representatives of the genus *Desis* are known as true aquatic species (see, e.g., HICKMAN 1949). Evidently because of their habits, the genera *Cambridgea*, *Gohia*, and the generotype of *Huara* have often been listed in Argyronetidae, but curiously enough, *Desis* has never been listed there.

The adaptive characters of *Desis* and *Argyroneta* are strikingly similar; they include the disappearance of the abdominal pattern, density and relative length of the hair covering, advanced position of the tracheal stigma, abundant distribution of tracheae as far as cephalothorax, etc. Besides, these groups are unique among Amaurobioidea in possessing two pa-

Table 15. Amaurobiidae: Desinae

	<i>Porteria</i> ¹	<i>Corasoides</i>	<i>Taurongia</i>	<i>Cedicus</i>
Figure	44, 119 – 120	121 – 126	122 – 123, 127	137 – 139
Size	medium	large	large – very large	large
Cribellum – colulus	co: semicircular	co: semicircular	cr: bipartite	long thin sclerotized plate
AS/PS basal thickness	3 – 4	3 – 4	lat.: 1 ½, v.: 2 – 3	ca. 2
Median spinnerets	short conical	short conical	short slender	rather long, conical
Tracheal stigma	short, close to colulus	rather wide, close to colulus	short, close to colulus	short, close to colulus
Abdominal pattern	white lateral stripes + 2 rows of white spots	white lateral stripes + 2 rows of white spots	BP	obscure simple BP
Shape of carapace	thoracic area circular	BP	BP, cephalic area long	± oval
Pattern of carapace	none	none	none	none
Fovea	long and deep	long, gradually widening	rather long, narrow	short and shallow
Size of AM	< PM	<< PM	> PM	subequal to PM
Shape of MOT	trapezoidal	subrectangular	quadrangular	strongly trapezoidal
Shape of chelicerae	very long, groove oblique	♂ long, ♀ with large boss	strong anterior boss	short and thick
Cheliceral teeth	2 wide apart + 4	6 + 3 (post.: 1 + 1 + 4)	2 – 3 + 3 (closely spaced)	4 + 5
Maxillae	strongly converging, margins parallel, apex ± rounded	long, distally enlarged and converging	long, distally enlarged and converging	long oval, parallel
Labium	as long as wide, truncate	long truncate	long truncate – notched	long truncate
Apex of sternum	long but rounded	long pointed	rectangular	right angle + short point
Feathery hairs	absent	absent	absent	absent
Tib. & met. v. sp.	2 + 3	4 + 3	3 + 3	3 + 3
Tarsal trichobothria	short indistinct	short indistinct	BP	BP
Trochanteral notch	distinct	absent	III – IV: shallow	absent
Tarsal spines	absent	absent	IV: 1 – 2 ventral	III – IV: numerous
Cymbial modifications	apex very long	apex curved, insertion median	insignificant	wide
Tibial processes	4 acute apical	3 apical (barbed, geniculate + lamellar)	2 apical	1 lateral + 1 large median
Origination of embolus	subbasal	subbasal	subapical	basal
Shape of embolus	grad. taper. curved spine	circular, thin coil	short spine	circular lamella, apex mod.
Conductor	folded semicircular plate, longitudinal, apex acute	wide spiral plate, apex gradually tapering	apical transversal plate, apex rounded	thin spiral lamella
Median apophysis	absent	absent	central membranous	thin rounded lamella
Tegular modifications	tegulum very small	semicircular plate	folded insignificant	ventral blunt process
Epigynal plate	median septum	median septum	median septum	caudal bar
Lateral teeth	absent	absent	obtusate lobes	obtusate lobes
Vulval ducts	?	complicated	rather simple	complicated
Special characters	cheliceral fang with central booth; sternum with light central band	epigyne with paired deep anterior foveae; metatarsi much longer than tarsi (2)	tarsal scopulae especially well developed	♂ palpal patellae with two large dorsal processes
Distribution	S. Neotropical	Australian	Australian	Oriental + E. Mediterranean

¹ for *Naevius*, see p. 251.

parallel characters, the adaptive significance of which is not yet clear. These are the reduction of the spine pattern of the two anterior pairs of legs with simultaneous increase in the number of spines on the posterior pairs, and the thick and in any case well-developed posterior median spinnerets.

The mating procedure of both *Desis* and *Argyroneta* occurs on dry land, and therefore the male and female genital organs are in no way adapted to aquatic life. This is fortunate for arachnologists, because the basic pattern of the genital organs seems to be the only thing that easily and undoubtedly reveals the phylogenetic affinities of both Desinae and Argyronetinae.

The tribus Desini is also characterized by the increased size of the colulus when compared with the cribellum of related groups. However, the shape of colulus is variable, and the thin, well-sclerotized type that is present in *Cedicus* (Fig. 139) and *Cambridgea* has certainly evolved independently, e.g., in the Macrobunid species *Rubrius major*. Altogether, *Cedicus* is a rather exceptional member of this group, not least because of its distribution, extending as far as Corse in the Western Mediterranean region.

Another tribus, Porteriini, undoubtedly includes *Porteria* and *Corasoides*, and probably *Naevius* and *Taurongia* also. The two first genera live far from each other, the former in Chile, the latter in Australia and New Zealand.

(continued on pp. 328–329).

<i>Cambridgea</i>	<i>Desis</i>	<i>Gohia</i>	<i>Huara</i>
124, 128	129–131 & HICKMAN (1949)	FORSTER (1964 a)	125, 132
very large – large	very large – medium	medium – large	large
co: thin sclerot. semicirc. 3–3 ½ short, flattened conical short, close to colulus obscure central folium	co: large hairy plate lat.: 1 ½–2, v.: 2–2 ½ long and thick, cylindrical very short, anter. removed absent (light yellow brown)	co: semicircular ? ? ? obscure BP	co: ± semicircular ? ? ? obscure
BP wide light bands long, rather deep variable long subrectangular long, directed forward 2 very strong + 3 long, distally enlarged and converging	flat oval, ant. truncate none very short variable wide trapezoidal long, directed forward 2 + (2–) 5–7 long and narrow, apex acute	flat oval, ant. truncate none short < PM long trapezoidal long, directed forward 1 + 3 long, subrectangular	oval BP none long and narrow < PM long (variable) rather long, groove oblique 2 + 2 long, distally widening
long truncate – notched pointed	long – very long, truncate pointed (gradually tapering)	long truncate pointed	long truncate continuous to petiolus
absent 3–5 + 3–4 BP (4–5 only) I–III absent, IV shallow III–IV numerous short bristles apex very long	absent I–II: none, III–IV: 2–3 + 3 in 2 parallel rows variable, ~ III–IV: shallow (II) III–IV: ventral	absent 2–3 + 2–3 BP III–IV: shallow absent	absent 4 + 3 BP ? absent
3–4 apical	2 rounded apical	1–2 apical	2 apical
central rather thin curved spine large longitudinal plate, distal margin furrowed	basal thin circular falciform plate, continuous with tegular plate	basal semicircular thin spine distal folded plate	basal circular coil narrow, ± falciform
small acute – reduced insignificant	subapical concave hook narrow central «fulcrum»	reduced insignificant	narrow hook base of embolus enlarged
trapezoidal median septum anterior unpaired rather simple	small caudal projection small subcaudal rather simple	insignificant absent simple, sem. rec. large oval	large transversal arch absent rather simple
femora with numerous lateral spines	all hairs long and densely spaced; femora with a single dorsal spine	–	well developed distal scopula in tarsi
Australian	Southern hemisphere, coastal; Japan & Galapagos Isl.	Subantarctic Australian	Subantarctic Australian

However, they have an exactly similar abdominal pattern of rare derivative type, they lack the median apophysis, and even the general pattern of both male and female genitalia is strikingly parallel, in spite of peculiar modifications due to long isolation. The Australian genus *Taurongia* is the only Cribellate one in this tribus, but is obviously similar to *Corasoides*, especially as regards female genitalia. The presence of a movable tibial apophysis in *Naevius* is unique among Amaurobioidea, at least, but such a structure could be derived from the complicated pattern of tibial apophyses in *Porteria*.

The tribus Myroini consists of *Myro*, *Omma-tauxesis*, *Gasparia*, and possibly also of the Cri-

bellate genus *Syroris* (generotype only). The three first-mentioned genera have spirally coiled vulval ducts and more or less modified eye patterns.

Cribellate *Maniho* and Ecribellate *Amphinecta* are very closely related, and especially in regard to male genitalia they could be treated as a single genus. However, there are feathery hairs in *Maniho*, but not in the specimens of *Amphinecta* investigated by myself. The epigyne of *Amphinecta* has quite a striking appearance: the lateral lobes bulge out into large, furrowed, globular structures, while the central plate is also distinctly protruding.

Marplesia is of uncertain position. The abundance of feathery hairs shows relationship with

Table 15. Amaurobiidae:

	<i>Ommatauxesis</i>	<i>Myro</i>	<i>Syroris</i>
Figure	133 – 134	135 – 136	
Size	medium – small	medium	medium
Cribellum – colulus	co: obtuse triangular	co: small triangular	cr: bipartite
AS/PS basal thickness	2 (AS cylindrical)	1 ½ – 2	1 ½
Median spinnerets	rather long, cylindrical	short cylindrical	short cylindrical
Tracheal stigma	wide, slightly removed	wide, close to colulus	wide, close to cribellum
Abdominal pattern	very distinct BP	BP	obscure
Shape of carapace	high BP	BP	BP
Pattern of carapace	wide light submarg. bands	none	none
Fovea	very long and narrow	short	short
Size of AM	AM < AL << PM < PL	strictly smallest	subequal to PM
Shape of MOT	very large trapezium	long trapezoidal	trapezoidal
Shape of chelicerae	groove very oblique	normal	normal
Cheliceral teeth	5 + 3	3 + 2	2 + 3
Maxillae	parallel, ± oval	parallel, ± oval	parallel, ± oval
Labium	as long as wide, truncate	wide, truncate	as long as wide, truncate
Apex of sternum	shortly pointed	pointed	obtuse angle
Feathery hairs	absent	absent	absent
Tib. & met. v. sp.	2 (– 3) + 3	2 (– 3) + 3	2 (– 3) + 3
Tarsal trichobothria	BP (3)	BP	BP
Trochanteral notch	absent	absent	absent
Tarsal spines	absent	absent	absent
Cymbial modifications	♂ unknown	insignificant	♂ unknown
Tibial processes		2 apical	
Origination of embolus		basal	
Shape of embolus		circular coil	
Conductor		membr. semicirc. lamella with folded margin	
Median apophysis		absent	
Tegular modifications		base of embolus enlarged, obtuse tegular apophysis	
Epigynal plate	small central	indistinct	indistinctly limited
Lateral teeth	absent	absent	absent
Vulval ducts	paired spiral	complicated (± spiral)	complicated (± spiral)
Special characters	eyes in three rows: AL/AM + PL/PM; distinct notch in carapace profile	anterior eye row strongly procurved	–
Distribution	Australian (Tasmania)	± circumantaretic (Crozet Isl. – Polynesia)	Australian (New Caledo- nia)

Maniho, but I have not examined male specimens of this genus personally, and thus the important information to be derived from the detailed structure of the male palpi has not been available.

Concerning the mutual relations of different Desine groups, the common ancestry of Desini and Myroini is undisputed, while at least *Taurongia* from my Porteriini seems to be related to *Cambridgea* and *Gohia*. The genera with feathery hairs are probably direct derivatives of some ancient branch of Matachiinae, but a derivation from a common stock with Myroini is possible as well.

Phyxelidinae

The representatives of the new subfamily Phyxelidinae have never been well known, and their

most distinctive characters have not been observed before. As far as our present knowledge extends, Phyxelidinae includes only Cribellate spiders. Their range covers the whole of the Ethiopian region, and in most parts of this region they have occupied the typical Amaurobiid habitats in common with representatives of Miturgidae: Machadoniinae, while other groups of Amaurobiid type are lacking. Phyxelidinae is further represented in the eastern Mediterranean by one species.

Altogether, four of the six genera of Phyxelididae are described here as new taxa, and the oldest name of the type genus, *Phyxelida*, has not been mentioned outside catalogues since the original description. The other previously described genus, *Themacrys*, has been alternati-

Desinae (continued).

<i>Gasparia</i>	<i>Maniho</i>	<i>Amphinecta</i>	<i>Marplesia</i>
FORSTER (1964 a, Fig. 81 – 86)	141; R. MARPLES (1959, p. 350)	140, 142	R. MARPLES (1959, p. 345, Fig. 14)
small – medium	medium	large	medium – small
co: reduced to setae	cr: bipartite	co: thin semicirc. chitinous	cr: bipartite
? cylindrical	1 ½ – 2	1 ½ (AS cylindrical)	2
? modified BP	rather long, cylindrical	long and slender	short conical
	wide, close to cribellum	very short, slightly removed	short, close to cribellum
	BP	BP	obscure BP
oval	BP	BP	BP
none	none	none	wide light marginal bands
indistinct	long and narrow	rather short	rather short
< PM	< PM	subequal to PM	variable
trapezoidal	long trapezoidal	± quadrangular	quadrangular
groove rather oblique	groove very oblique	long, directed forward	normal
3 + 1	2 wide apart + 5 – 7 +	2 + 2 + central serrate carina	2 + 3
	central small teeth		
distally enlarged	parallel, apex with obtuse	distally enlarged, ♂ longer	parallel, apex laterally
long truncate	angle	than ♀	rounded
shortly pointed	as long as wide, notched	long, truncate – notched	variable, truncate – notched
	pointed	right angle	shortly pointed
?	present	absent (no superficial hairs)	abundant
I – II: 0, III – IV: 2 + 0 – 1	3 + 4	2 – 3 + 3	3 + 3
BP (2 – 4)	BP	BP	BP (relatively short)
? absent	distinct	distinct	distinct
insignificant	absent	absent	absent
2 apical	complic. trichob. pattern	very long apex, trichob. pres.	insignificant
basal	apical + basal	2 – 3 apical	3 – 5 apical
semicircular coil	apical	apical	basal
semicircular lamella with	apical spiral coil	apical spiral coil	strongly coiled
folded margin	complicated membranous	membranous spiral	? (membranous lamella)
absent			
	lateral cup-shaped	lateral cup with distal hook	?
	base of embolus with	base of embolus with large	?
	large «term. apophysis»	«term. apophysis»	?
small central trapezium	transversal caudal	extremely large and protrud.	variable
absent	absent	absent	absent
complicated (± spiral)	complicated	? (probably simple)	rather simple, sem. recept. oval
lateral condyle of chelicerae ± reduced	complicated trichobothrial	complicated trichobothrial	
	patterns on legs and palpi;	patterns on legs and palpi;	
	posterior spinnerets with	abdomen anteroventrally	
	rather long apical segment	swollen	
Subantarctic Australian	Australian (New Zealand)	Australian	Australian

vely included in Psechridae or Tengellidae (cf. p. 309), while the remaining species have been described under the generally favoured generic names that refer to the most obscurely defined genera, e.g., *Auximus* and *Amaurobius*. Curiously enough, the only Palearctic species was identified as the well-known species *Amaurobius fenestralis*, and published by ROEWER (1959).

Some representatives of the type genus of the family are very well known and are in fact the only ones that have ever been sufficiently characterized to make identification possible or at least reliable, because LAWRENCE (1939) published a revision of the genus *Haemilla*, which is here synonymized with *Phyxelida*, and he also described some additional species in two previ-

ous papers (LAWRENCE 1937, 1938). Some of his species, however, belong to other genera of Phyxelidinae.

Phyxelidine spiders are easily distinguished from all other large and medium sized Amaurobioidean spiders by the lack of the typical basic pattern of trichobothria, and even by the total lack of distinct tarsal trichobothria. Most probably the lack of tarsal trichobothria is not a primary one, but is a result of reduction in their ancestors. In addition to this all the Phyxelidine genera have a characteristic group of sinuous spurs at the base of the median face of the palpal femur in both sexes. Most probably this serves as some kind of stridulatory organ. A corresponding organ is also present in the Macrobinine genus *Pimus*, but there it

Table 16. Amaurobiidae: Phyxelidinae.

	<i>Vidole</i>	<i>Xevioso</i>	<i>Themacrys</i>	<i>Phyxelida</i>	<i>Malaika</i>	<i>Matundua</i>
Figure	388, 393	383	65, 384, 387, 392	60, 379 – 382, 394	390 – 391	395 – 396
Size	large	large – medium	large – medium	medium – large	large – small	medium – large
Abdominal pattern	dark obscure BP	light obscure BP	BP – obscure	light obscure BP	distinct – obscure BP	light BP
Fovea	long and deep	long, gradually widening	long and very wide	short, gradually widening	rather long, deep and wide	short, dilated at both ends
Size of AM	≥ PM	> PM	variable	≤ PM	≤ PM	≥ PM
Shape of MOT	long rectangular	subrectangular	long, ± rectangular	variable	variable	± quadrangular
Cheliceral teeth	5 – 6 + 5	5 + 5	6 – 7 + 5	5 – 6 + 6 – 7	5 – 7 + 3 – 4	5 – 6 + 5 – 6
♂ chelic. modifications	longer and more slender	subapical constriction + distinct transv. furrows	ventrobasal boss covered with dense area of spinules	slightly more slender	slightly more slender	slightly more slender
Labium	long, notched	long, strongly notched	long, notched	wide – as long as wide, truncate	variable in length, distally ± rounded	as long as wide, truncate
Apex of sternum	rounded right angle	rounded right angle	obtuse	right angle	right angle – shortly pointed	pointed
Relative length of legs	BP	long	long – very long	very long – long	long – BP	BP – long
Calamistrum	dense central + wide pseudocalamistral area	long and dense, subapical	very long, subapical	long subapical	long – BP	long subapical
Femoral spines	2 rows	apical only	3 long rows	variable	a few	a few
Palpal femoral thorns	3 – 5 distinct in one row	3 – 5 in one row	large triangular group	3 – 6 in one row	4 – 5 in one row – ± red.	1 very strong + oval area
Metatarsal modifications of ♂	basal part weakly thickened	central tubercles + subapical group of spinules	basal spur – S-curve – subcentral group of spinules	strong basal spur	ventral longitudinal excavation in basal part	subcentral spur + central area of spinules
Tib. & met. v. sp.	2 + 3	3 + 3 long	irregular (3 + 4)	0 – 3 + 3 – 4, tib: apical half only	0 – 3 + 3, less in ant. legs	2 – 3 + 3
Tarsal scopulae	moderate	dense	moderate	weak – moderate	weak	moderate
Cymbial modifications	subbasal projection	subbasal projection	small subbasal projection	subbasal projection	wide lateral excavation	crescent-shaped
Shape of palpal tibia	suboval	suboval	long subcylindrical	long subcylindrical	short	obtusely triangular
Margin of distal excavation	2 lobes + central membrane	rounded + small central membranous projection	rounded lobe with central thorn + lobe with setae	1 – 2 ± acute lobes + lobe with setae	simple central process (excavation very large)	hammer-shaped process
Origination of embolus	central	apical	subbasal	central	basal	subbasal
Shape of embolus	semicirc., partly screwed	thick screw in 2 coils	laminar, distally tapering	thin semicircular	thin semicirc., apex coiled	semicircular coiled spine
Primary conductor	large three-lobate, centrally covering the embolus	semicylindrical around the base of embolus	large spiral arch with mesally pointed apex	large spiral arch with mesally pointed apex	very large membranous plate with subbasal screwed apex	large apical with free lateral projection and screwed apex
Median apophysis	totally reduced	short and acute	narrow, directed forward	narrow, directed backward	branched lamina	totally reduced
Fulcrum	complicated, partly membranous lamella	complicated, partly membranous lamella	absent	absent	absent	absent
Tegular apophyses	3 acute lobes	3 lobes (1 large forked)	insignificant	insignificant	small central carinae	large basal boss
Epigynal plate	rounded pentagonal	variable	trapezoidal – rectangular	caudally ± rounded	semicircular projection	complicated
Epigynal foveae	central depression	paired small	paired small	small, covered with plates	small unpaired	three
Seminal receptacula	small central globular	large globular	large globular	small globular	long oval with inner spiral	small oval, anterior
Special characters	–	abdomen ± cylindrical	–	–	♂ maxillae with large dorsal triangular projection	–
Distribution	S. Ethiopian	S. Ethiopian	S. & C. Ethiopian	Ethiopian – E. Mediterranean	S. Ethiopian – Malagasy	S. Ethiopian

Table 17. Amaurobiidae: Stiphidiinae.

	<i>Stiphidion</i>	<i>Tjurunga</i>	<i>Baiami</i>
Figure	112	114	113, 117 – 118
Size	medium	medium	large – medium
Cribellum – colulus	cr: widely triang., bipartite	co: paired triangular	cr: BP, bipartite
Anterior spinnerets	long conical	short conical	short, strongly conical
Abdominal pattern	central light band	central light band	obscure – distinct BP
Shape of carapace	cephalic area narrow	cephalic area narrow	cephalic area wide
Fovea	short and deep	short and shallow	wide and deep
Anterior eye row	strongly recurved	± straight	± straight
Size of AM	largest	< PM	smallest
Shape of MOT	long rectangular	long trapezoidal	long rectangular – trapezoidal
Cheliceral teeth	2 + 3	7 decreasing in size + 4	(1 –)2 + 5 – 15
Teeth of post. chel. margin	close to each other	close to each other	extremely widely spaced
Labium	as long as wide, notched	wide, distally rounded	variable
Apex of sternum	pointed	long and narrow	shortly pointed
Tib. & met. v. sp.	2 + 3	3 + 3	irregular (~ 3 + 4)
Tarsal trichobothria	BP	BP (short and numerous)	BP (widely spaced)
Trochanteral notch	absent	absent	distinct – shallow
Position of calamistrum	subcentral		subapical – central
Shape of cymbium	unmodified	♂ unknown	narrow, apex long
Shape of palpal tibia	basally tapering		long, ± cylindrical
Tibial processes	1 thick subapical		2 apical lamellae
Origination of embolus	apical		apical
Shape of embolus	thin semicircular		caud. directed curved spine
Functional conductor	large tegular projection		paired membrane along the
	with double caudal apex		tegular margin
Median apophysis	absent		strongly curved, subbasal
Epigynal plate	indistinctly limited	large triangular	centrally protruding arch
Vulval structure	2 pairs of seminal receptacula	? (epig. strongly sclerot.)	complicated pattern of ducts
Special characters	very distinct subapical bundle of hairs on palpal tibia	thoracic area subcircular; abdominal pattern distinctly limited ventrally and dorsally	tarsi long, curved downwards
Distribution	Australian	Australian	Australian

is restricted to the male sex, and the teeth are not sinuous, but gradually tapering towards the apex. Thus these structures may be regarded as instances of parallel evolution, and not as a proof of direct relationship. In any case, *Phyxelidinae* and *Macrobuninae* are regarded here as closely related.

The site of the calamistrum on the apical half of the fourth metatarsus has been noted in *Haemilla* by LAWRENCE (1937, 1938), but it is an excellent key-character for all species of this family.

The general trend towards strong sexual dimorphism of legs and the lack of tarsal trichobothria in *Phyxelidinae* might be suggested as proof of affinity with the branch *Zodariidae* or with the family *Titanoecidae*. However, the basic patterns of abdominal colouration, the structure of male and female genitalia, and of maxillae, sternum, chelicerae, and carapace, undoubtedly refer to *Amaurobioidea* and, in more detail, to the vicinity of *Macrobunidae* and *Stiphidiinae*.

The five Ethiopian genera *Themacrys*, *Xevioso*, *Phyxelida*, *Matundua*, and *Malaika*, constitute

a rather compact group (cf. Table 16), while *Vidole* is deviating.

Stiphidiinae

The history of the classification of the type genus, *Stiphidion*, has been discussed on p. 309. Although *Stiphidiinae* is here included in *Amaurobiidae*, its relationships to the other subfamilies are by no means cleared up, and the representatives of my *Stiphidiinae* (Table 17) possess a number of enigmatic characters, unique among *Amaurobiidae*.

The three genera included, *Stiphidion*, *Tjurunga*, and *Baiami*, as well as several undescribed ones I examined in Cambridge, are all entirely Australian. All these genera share the presence of abundant feathery hairs, and the cribellum as well as colulus (when present) are always paired structures. However, the halves of the colulus of *Tjurunga* are throughout fused, and thus a confusion with the paired colulus of *Agelenidae* or *Hahniidae* is quite impossible.

The calamistrum of *Stiphidion* is central, and

Table 18. Amaurobiidae: Rhoicininae.

	<i>Rhoicinus</i>	<i>Barrisca</i>	<i>Xinguisiella</i>
Figure	195; EXLINE (1950, 1960)	CHAMBERLIN & IVIE (1936, Fig. 28 - 32)	MELLO-LEITÃO (1940 d)
Size	large - medium	medium	medium
Colulus	large, widely triangular	?	?
Pattern of spinnerets	BP	BP	BP
Apic./bas. segment of PS	ca. 1/2	ca. 1/2	?
Abdominal pattern	BP - obscure	wide central band + patches	obscure BP
Shape of carapace	BP pear-shaped	wide pear-shaped, cephalic area exceptionally narrow	low, pear-shaped
Fovea	long and rather deep	short and deep	long and deep
Size of AM	variable (but $\pm$ subequal to PM)	< PM	>> PM
Shape of MOT	long rectangular	slightly trapezoidal	trapezoidal
Cheliceral teeth	3 + 3	4 + 3	4 + 3
Labium	long - as long as wide, truncate	wide, truncate	long, truncate
Apex of sternum	pointed	truncate	pointed
Tib. & met. v. sp.	3 + 3	3 + 3	4 + 3
Tarsal trichobothria	double BP (2 rows)	3 - 4	?
Trochanteral notch	distinct	present	?
Cymbial modifications	apex long, 1 long dorsal seta	unmodified	♂ unknown
Tibial modifications	lateroapical pit	lateroapical pit	
Origination of embolus	apical	apical	
Type of embolus	thin with laminar terminal apophysis	thick, with curved apex	
Secondary conductor	narrow curved	small curved lamella	
Median apophysis	large, complicated	apical transversal lamella	
Epigynal plate	caudally projected into 3 lobes	♀ unknown	lateral lobes
Vulval structure	U-shaped lateral ducts		?simple
Seminal receptacula	small + several secondary rec.		?
Special characters	cocoon carried by spinnerets	ejaculatory duct strongly coiled, legs spotted	cocoon carried by spinnerets
Distribution	C. Neotropical	N. Neotropical	C. Neotropical

that of *Baiami* subapical - central, corresponding in position to that of Phyxelidinae, while the calamistrum of all other Amaurobioidean species is subbasal, or at least extends also to the subbasal part of the fourth metatarsus.

The male genital organs of *Stiphidion* and *Baiami* each represent a highly specialized type with evident structural reduction (cf. Table 17), while the males of several undescribed species of this subfamily agree more closely with the basic pattern of the Amaurobid palp.

The eye pattern of *Stiphidion*, cheliceral armature of *Baiami*, and exceptional abdominal pattern of both *Stiphidion* and *Tjurunga* are further evidence of the general trends of specialization in this group.

Rhoicininae

The type genus *Rhoicinus* was originally described in Lycosidae (SIMON 1898 b), and the subfamily Rhoicininae was created for it because its eye pattern was of an Agelenid type. Rhoicininae was later generally regarded as

intermediate between Lycosidae and Agelenidae (e.g., PETRUNKEVITCH 1923), until EXLINE (1950) transferred it to Pisauridae. The change was based mainly on the presence of distinct trochanteral notches in all the genera that were included in this subfamily by her (1950 and 1960) as well as by ROTH (in litt.). ROTH (1964) greatly overemphasized the taxonomic significance of the trochanteral notch, at least as regards Zodariides and Amaurobiides. In the present work, I have mentioned the existence of several families and subfamilies in which there are both types of trochanterae, or even a gradual series between them. The following pairs of closely related genera demonstrate the slight value of this character: *Drassodes* - *Haplodrassus*, *Forsterina* - *Badumna*, and *Malthonica* - *Tegenaria*.

The close relationship proposed here for *Calacadia*, *Exlinea*, and *Metaltella* is incontrovertible, although EXLINE (1960) included *Calacadia* in *Rhoicininae* and all the species of *Exlinea* and *Metaltella* have previously been placed in Dictynidae or Amaurobiidae. HOMANN (1952, 1961 a) criticized the inclusion of *Rhoicinaria* in Rhoi-

cininae on account of the histological structure of the indirect eyes, and this genus is here included in another subfamily of Amaurobiidae, Altellopsinae. Here it must also be remembered that one of the most important key characters of Rhoicininae, the attachment of cocoon to spinnerets (SIMON 1898 b, EXLINE 1950, HOMANN 1961 a, and ROTH in litt.), has been proved to have originated through convergence in several different lines of spider evolution (PETRUNKEVITCH 1926).

My Rhoicininae includes only the type genus of EXLINE's similarly named subfamily of Pisauridae, but the remaining genera, *Barrisca* and *Xingusiella*, have also been listed in Pisauridae (MELLO-LEITÃO 1940 c, ROTH 1964).

As the taxonomic value of the trochanteral notch and of the exceptional manner of cocoon-carrying has been made clear, there is no reason to exclude Rhoicininae from Amaurobioidea. Rhoicininae could well be derived from an ancient stock in common with Macrobulinae. Both EXLINE (1950, p. 1) and HOMANN (1952, p. 357) have seriously confused the concept of plumose hairs. All the erect hairs of *Rhoicinus* are of plumose-lamellar type as they are in all representatives of Amaurobiidae (except Stiphidiinae and some Desinae), Lycosidae, and Dolomedidae (cf. p. 372), while there are additional feathery hairs in most species of Agelenidae and Pisauridae. In my opinion, neither Pisauridae nor Dolomedidae can be regarded as intermediate between Agelenidae and Lycosidae, although Pisauridae auct., corresponding to the above two families, has been considered intermediate by MELLO-LEITÃO (1941 a, p. 107) and others. Cf. also Fig. 11.

Table 18 summarizes the characteristics of Rhoicininae as it is limited in this paper.

Macrobulinae

The name Myropsisinae was proposed by PETRUNKEVITCH (1928) for the single genus, *Myropsis*, in Dictynidae s. str. on account of exceptional eye pattern only. Myropsisinae, however, is inappropriate owing to homonymy of the type genus, and BONNET (1957) replaced this name with Macrobulinae. The genus had then to be referred to as Macrobulinae Petrunkevitch 1928 (ICZN 1961: § 39 a (i)), an absurd procedure in a group where the limitation of

families has been as poorly comprehended as it is in spiders. Thus the deletion of this paragraph by the XVI International Congress of Zoology is a welcome step towards consistency in the rules of nomenclature covering family-group names.

In spite of its inappropriateness to the original definition and limitation, the name Macrobulinae seems the most suitable for this subfamily, and no other names of family category have previously been based on any of its genera.

The subfamily Macrobulinae is mainly Neotropical, but there are also some genera in the Holarctic (*Arctobius*, *Pimus*, and *Zanomys*), and three genera peculiar to the Ethiopian realm, while the zoogeographically very interesting genus *Macrobulus* is represented in the southern parts of both Neotropical and Ethiopian regions.

The Ethiopian genera seem to be most closely related to *Macrobulus* while other Neotropical as well as the Holarctic genera constitute a second tribe, Rubriini (Table 19). Among the latter, *Arctobius* – *Pimus* – *Zanomys* – *Retiro* – *Auximella* comprise a series of closely related genera. Another group, *Rubrius* – (? *Virgilus*) – *Anisacate* – *Livius* – *Neoporteria* – *Urepus* – *Yupanquia* is less compact, and possibly further related to *Auximella*. *Emmenomma* is largely deviating, especially because of its peculiar eye pattern, but it can clearly be derived from the latter branch of Rubriini.

The whole subfamily Macrobulinae is characterized especially by obliqueness of the cheliceral grooves and the small size of the anterior median eyes, both these traits being repeatedly used as a characteristic of the genus «*Auximus*». Thus it is not surprising that most of the species of *Retiro* and *Auximella* were originally described in *Auximus*, while none of the Neotropical species that have sometimes been assigned to the latter genus remain outside my Macrobulinae.

In most species of Macrobulinae, the male palpal tibia is strongly modified, and bears a more or less cup-shaped lateroapical concavity. Strange modifications are present also in the embolus and conductor of many species, while the median apophysis is generally simple.

Several kinds of structural modifications occur in the legs of males of Macrobulid genera, but are practically absent in other subfamilies, e.g., there are femoral spurs in the second pair of legs in *Macrobulus*, coxal spurs in the first pair

Table 19. Amaurobiidae: Macrobuni-

	<i>Arctobius</i>	<i>Pimus</i>	<i>Zanomys</i>
Figure	68 – 69, 143 – 147	154 – 155	153 – 158
Size	large	medium	minute
Cribellum – colulus	cr: bipartite (large)	cr: bipartite	cr: undivided
Abdominal pattern	central band (~ BP)	BP	simple BP
Spinnerets	thick, PS: ap./bas. > ½	BP	BP
Shape of carapace	cephalic area long	BP	oval, anteriorly tapering
Pattern of carapace	three light bands	none	none
Tracheae in cephalothorax	absent	?	absent
Fovea	long, wide, and deep	short and narrow	none
Size of AM	AL > AM > PM	< PM	minute
Shape of MOT	quadrangular	trapezoidal	long, strongly trapezoidal
Number of cheliceral teeth	2 + 3	4 + 4 – 5	4 + 3
Pattern of post. chel. teeth	small, widely spaced	1 + 1 + 2, all moderate	subequal, closely spaced
Pattern of ant. chel. teeth	large, closely spaced	slightly larger	slightly larger
Labium	long, truncate	long, notched	wide rounded
Apex of sternum	obtuse angle	obtuse angle	rounded
Tib. & met. v. sp.	3 + 3	4 + 3	3 + 3 (weak bristles)
Tarsal spines	III – IV	absent	absent
Tarsal trichobothria	BP (7 – 10)	BP (4 – 7)	BP (2)
Trochanteral notch	absent	absent	absent
Cymbial modifications	none	basal angle + furrow	2 basal ridges
Tibial processes	lateral lamina + apical acute process	2 simple lateral	distal cup with modified margins
Origination of embolus	throughout the tegulum	subbasal	central
Shape of embolus	wide spiral lamella + spine	arched lamella	arched lamella
Primary conductor	membranous funnel	flat superficial plate	distally forked lamella
Median apophysis	curved and folded	subapical, hooked	basal, distally cup-shaped
Secondary conductor	thin membranous	long branched membrane	superficially not visible
Origination of secondary conductor	close to tegular margin	below the base of conductor	below the conductor
Tegular apophysis	absent	absent	insignificant
Epigynal plate	well-defined transversal	anterior tongue	caudal ± trapezoidal
Epigynal specialities	semicircular arch	± semicircular arch	unpaired anterior fovea
Lateral teeth	rectangular lobes	absent	absent
Seminal receptacula	large globular	large globular	globular
Special characters	femoral spines absent	♂ palpal femora with a stridulatory mechanism of Phyxelidine type; ♂ I coxae with a strong spur	one very long trichobothrium in tib, mt, and t.
Distribution	N. Holarctic	W. Nearctic	W. Nearctic

of legs in *Pimus*, and in the latter genus a stridulatory organ similar to that of Phyxelidinae is present at the base of the palpus.

I have personally observed the habits of *Arctobius agelenoides* (Emert.) 1919 in the field (see LINDQVIST 1964). Its web is reduced to a long tube completely enclosed by the moss layer, and the spider itself lives at the bottom of this tube.

Altellopsinae

This new subfamily is here created for some Neotropical genera of small spiders. Its Cribellate representatives were originally described in Dictynidae, evidently on account of their small size combined with the reduced number of tarsal trichobothria. *Tugana* was later transferred to

Amaurobiidae (GERTSCH in ROEWER 1954 a). In fact, this was a provisional placing (GERTSCH in litt.), as it was evident that *Tugana* could not be related to Dictynidae s. str. The lack of male specimens in all the typical genera of Altellopsinae makes it difficult to place this subfamily, but most of its characters refer to Macrobininae rather than to any other subfamily of Amaurobiidae.

Altellopsis, *Yacolla*, *Neuquenina*, and *Tugana* constitute a compact group of genera, and *Rhoicinaria* seems to deviate from them mainly because of its trochanteral notch and reduced cribellum (Table 20).

This group is characterized by the exceptional structure of the epigyne. There are no epigynal foveae and there is no well-limited plate, but the

nae (continued on pp.336 – 337).

<i>Retiro</i>	<i>Auximella</i> ¹	<i>Rubrius</i>	<i>Emmenomma</i>
45, 162 – 163, 166 – 168	169 – 173	46, 151–152, 156–157, 159–160	179 – 180
medium – large	medium – large	large – small	medium – large
cr: bipartite light BP with dark spots rather long	cr: undivided (large) BP (– very dark) ♀: BP, ♂ longer	co: semicircular (– triang.) BP BP	co: semicircular light BP BP
BP none present	BP none present	BP lateral bands – obscure ?	BP obscure lateral bands ?
long, gradually widened minute	short and narrow minute	usually long and narrow < PM	long and narrow strictly smallest
long trapezoidal 5 – 6 + 3	variable 4 – 7 + 3	long trapezoidal – rectangular 3 – 7 + 4 – 6	twice as long as wide 4 + 4
subequal, closely spaced large, continuous as long as wide pointed	1 + 1 + 1 + decreasing row large, continuous long – as long as wide long pointed	1 – 2 separate + 2 – 5 adjacent much larger, often partly fused as long as wide – wide pointed	1 + 1 moderate + 2 minute 1 remote + 3 widely spaced wide, truncate pointed
(2 –) 3 + 3 absent BP (4 – 7) absent	3 + 3 absent BP (4 – 8) shallow	3 + 3 – 4 III – IV BP (4 – 8) practically absent	3 + 3 absent BP shallow
basolateral projection very complicated (3 – 4), distal cup distinct apical	insignificant basal distal cup with acute marginal processes	variable basal + lateral lateral lamina + apical ± complicated process	basodorsal boss 3 apical (1 very long, falciform, others short)
transversal s-shaped very large and complicated thin subbasal rounded membranous below the conductor	basal arched lamella arched lamella totally reduced thin membrane central	central – subapical transversal coiled spine acute folded spiral usually long and narrow spiral membrane between embolus and con- ductor	subbasal arched lamella L-shaped plate transversal acute plate complicated membrane between embolus and con- ductor
distinct, outstanding caudal, ± reniform distinct lateral foveae absent oval	distinct, outstanding bilobate transversal (variable) ± insignificant anterior large globular	absent rather variable, ± bilobate (variable) absent globular	absent triangular coiled ducts distinct caudal small globular
white reticulations shining through the integument		cheliceral modifications according to a general trend	AL very large, PL also exceptionally large
N. & C. Neotropical	Neotropical	S. & C. Neotropical	S. Neotropical

¹For *Urepus*, see p.273

large seminal receptacula shine through the integument. In the Cribellate genera, the cribellum is small and undivided. The abdominal pattern is more or less inconspicuous in all but one genus, *Yacolla*, and the shape of abdomen tends to be characteristically more elongate than in other subfamilies of Amaurobiidae.

It is, in fact, probable that this group is rich in species in the Neotropical region, but that most of the species have been overlooked on account of their small size and seemingly cryptic habits.

Two six-eyed genera, left here as incertae sedis, are worth mentioning here. *Tandil* is poorly described by MELLO-LEITÃO (1940 b), but he mentions the presence of a bipartite cribellum. The Ecribellate genus *Symphysia* has a widely

deviating epigyne and a high carapace with distinct pattern.

Metaltellinae

The representatives of this exceptionally homogeneous subfamily have previously been listed in Dictynidae, Amaurobiidae, Agelenidae, and Pisauridae. The variation of genital organs especially is slight in this group, while the generic criteria are found in the armature of the chelicerae, size of eyes, etc. (Table 21).

Metaltellinae is unique among Amaurobid subfamilies in lacking median apophysis in all its species. EXLINE (1960) confused the concept of conductor with the analogical structure which is called secondary conductor in this paper. She

Table 19. Amaurobiidae:

	<i>Anisacate</i> ¹	<i>Yupanquia</i>	<i>Macrobusus</i>
Figure	149 – 150	148	170, 174, 178
Size	medium	medium	medium – small
Cribellum – colulus	cr: indistinctly bipartite	cr: undivided	cr – co: undivided
Abdominal pattern	BP	BP	BP
Spinnerets	BP	BP	BP
Shape of carapace	BP	cephalic area wide	BP – oval
Pattern of carapace	dark striae (~ bands)	none	none
Tracheae in cephalothorax	absent	?	?
Fovea	wide and deep	long and narrow	variable
Size of AM	< PM	minute	≥ PM
Shape of MOT	± quadrangular	trapezoidal	trapez. – long trapez.
Number of cheliceral teeth	4 – 5 + 3	10 + 3	4 – 15 + 3 – 5
Pattern of post. chel. teeth	3 central largest	1 + 4 moderate + 2 – 6 minute	2 – 9 moderate + 2 – 6 minute
Pattern of ant. chel. teeth	acute, contiguous	large and contiguous	variable
Labium	wide, truncate	as long as wide, notched	wide – as long as wide
Apex of sternum	continuous to petiolus	pointed	obtuse – pointed
Tib. & met. v. sp.	3 + 3	3 + 3	3 + 3
Tarsal spines	absent	absent	absent
Tarsal trichobothria	BP (3)	BP (5)	BP (3 – 6)
Trochanteral notch	absent	absent	absent
Cymbial modifications	♂ unknown	♂ unknown	basal excavation
Tibial processes			large concavity with marginal processes
Origination of embolus			apical
Shape of embolus			spiral lamella with loop
Primary conductor			large with 2 branches
Median apophysis			large superficial plate
Secondary conductor			spiral membrane
Origination of sec.cond.			behind median apophysis
Tegular apophysis			absent
Epigynal plate	caudal trapezoidal	narrow transversal caudal	bilobate (+ central septum)
Epigynal specialities	–	anterior rugose area + transversal furrow	seminal receptacula with internal ducts
Lateral teeth	anter., obtuse triangles	absent	absent
Seminal receptacula	small globular	bilobate anterior	large subglobular
Special characters			anterior eye row usually strongly procurved: ♂ ant. femora with a spur
Distribution	S. Neotropical	S. Neotropical	S. Neotropical – S. Ethiopian

¹ For *Livius*, see p. 244.

did in fact figure the primary conductor (ExLINE *op. cit.*, p. 606, Fig. 25 and 27), but no term was applied to this nonfunctional vestige. Both embolus and secondary conductor are greatly modified in Metaltellinae as is seen when they are compared with the corresponding basic types of these structures in Amaurobiidae. Therefore, ExLINE (*op. cit.*, p. 607) named a part of the embolus in *Calacadia* terminal apophysis in order to attain consistency within her Rhoicininae.

The spiny process of the male palpal patella of some species of Metaltellinae is surprisingly similar to the corresponding structure in the Dictynid genus *Cybaeus*, but they are regarded here as results of convergent evolution only.

The similarity between the Cribellate and

Ecribellate genera is probably more striking in Metaltellinae than in any other group analyzed during this study.

The Metaltelline spiders are known to occur only in the Central and Southern parts of the Neotropical region, and many of them seem to be among the dominant spiders in this area.

Amaurobiinae

The large and heterogeneous family Amaurobiidae auct. was first subdivided by PETRUNKEVITCH (1939 a), and his Amaurobiinae is largely identical with mine, thanks to the excellent key-character provided by the structure of the calamistrum. PETRUNKEVITCH (*op. cit.*) and all other authors until now have used the

Macrobininae (continued).

<i>Chresiona</i>	<i>Pseudauximus</i>	<i>Obatala</i>
172	164 – 165, 171	175
small – medium	medium	medium
co: transversal plate	cr: undivided small	cr: undivided
light BP	simple BP	BP
BP	all pairs long cylindrical	BP (rather slender)
BP (cephalic area wide)	BP	BP
lateral bands	dark striae (~ bands)	almost unicolorous
?	absent	?
short	long and narrow	long and narrow
< PM	≥ PM	< PM
long subrectangular	long subrectangular	trapezoidal
4 – 5 + 4	6 – 7 + 4	5 – 7 + 5
subequal and separate	1 + 1 + 2 – 4 in decreasing row	1 + 1 + 3 – 5 minute subequal
all large, fused to a keel	3 contiguous, of incr. size, 1 separate	unequal contiguous
as long as wide	wide, deeply notched	as long as wide
continuous to petiolus	continuous to petiolus	pointed
3 + 3	3 – 4 + 3	I: 4 – 5 + 6, II – IV: 3 + 3
absent	III – IV	numerous rigid setae
BP (3)	BP (2 – 4)	4 of alternative size
absent	absent	absent
♂ unknown	basolateral furrow	♂ unknown
	1 complicated apical	
	apical – subapical arched lamella,	
	distally modified	
	protruding acute spine	
	reduced – absent	
	membranous cup	
	close to tegular margin	
	small acute at base of the fulcrum	
semicircular projection	triangular	caudal arched plate
submarginal foveae of epigynal plate	–	–
absent	absent	absent
small globular	small globular	small globular
white reticulation shining	tarsal trichobothria central,	
through the integument	with numerous erect hairs,	
	conductor nonfunctional, cheliceral	
	groove very oblique	
S. Ethiopian	S. Ethiopian	S. Ethiopian

term biseriate, but I have investigated the microstructure of the hairs of the calamistrum, and as a result of this study I prefer to describe the structure of the Amaurobine calamistrum in other terms. J. BERLAND (1913, 1916) presented excellent surveys of the hair patterns of various types of calamistrum but, unfortunately, she did not examine the microstructure of the hairs, and the evolution of the Amaurobine calamistrum remained obscure.

There is a single row of perfectly smooth, regularly curved calamistral hairs in all Cribellate representatives of Amaurobiidae and Dictynidae, as well as in several Cribellate groups outside Amaurobioidea. These hairs constitute the calamistrum proper of Amaurobiinae; they are also the only smooth hairs that can be found in

Amaurobiides and Zodariides (cf. also Fig. 10). It is probable that these simple hairs have evolved from the plumose-laminar type of hairs through high selective pressure. Thus they are probably not homologous with the simple or simple-serrate type of hairs that constitute the whole hair covering in Araneoidea and Hypochiloidea, and a part of it in the family Segestriidae.

The surroundings of the calamistrum proper are generally covered with a normal plumose-laminar type of hairs in Amaurobiides and Zodariides, at least, but they form different patterns in different groups of spiders. Usually there is a narrow bald area dorsally to the calamistrum proper, and the long calamistral hairs are obliquely curved over this area. It is usually followed by an unmodified, equally

Table 20. Amaurobiidae: Altellopsinae.

	<i>Altellopsis</i>	<i>Yacolla</i>	<i>Neuquenina</i>	<i>Tugana</i>	<i>Rhoicinaria</i>
Figure	181, 184	183, 190	185 – 187	62, 188	182, 189; EXLINE (1950)
Size	small	small	small – medium	small	small – medium
Cribellum-colulus	Cr: undivided	cr: undivided	cr: undivided	cr: undivided	co: triangular
Anterior spinnerets	short cylindrical	short conical	short conical	short cylindrical	short conical
Posterior spinnerets	short cylindrical	short cylindrical	short cylindrical	short cylindrical	short cylindrical
Abdominal pattern	none	simple basic type	none	none	obscure
Fovea	none	long	long	rather short	short
Size of AM	< PM	< PM	< PM	none	< PM
Shape of MOT	wide trapezoidal	wide trapezoidal	trapezoidal	–	trapezoidal
Cheliceral teeth	2 + 2	4 + 3	4 + 3 – 5	4 + 5	2 + 3
Labium	very wide	as wide as long	wide	as long as wide	wide
Sternum	rounded	rounded	shortly pointed	pointed	shortly pointed
Tib. & met. v. sp.	2 + 1	3 + 3	2 + 2 – 3 + 3	2 + 2	3 + 3
Femoral dorsal spines	none	none	none	I: 2	present
Tarsal trichobothria	1	2	3	2	3
Cymbium ¹	♂ unknown	♂ unknown	♂ unknown	♂ unknown	unmodified
Tibial processes					small lateroapical
Embolus					short bulbous
Conductor					narrow, ± membranous
Shape of tegulum					oval with triang. apophysis
Median apophysis					absent
Epigynal fovea	none	none	none	none	none
Epigynal plate	caudal with central notch	caudal with central notch	caudal with central notch	indistinctly limited	caudal with paired projection
Vulval structure	simple	rather simple	simple	simple	simple
Seminal receptacula	2 pairs closely spaced	2 pairs widely spaced	1 pair globular	1 pair large oval	very large globular
Special characters				cephalic area gibbous	♂ weak, ♀ distinct trochanteral notch; cocoons carried by spinnerets
Distribution	S. Neotropical	C. Neotropical	C. & S. Neotropical	N. Neotropical	C. Neotropical

Table 21. Amaurobiidae: Metaltellinae.

	<i>Exlinea</i>	<i>Calacadia</i>	<i>Metaltella</i>	<i>Ciniptella</i>
Figure	192, 194	193; EXLINE (1960)	191	—
Size	very large — large	large — medium	medium — large	medium
Cribellum — colulus	cr: bipartite	co: widely triangular	cr: bipartite	cr: ± reduced, undivided
Spinnerets	thick BP	± slender BP	± slender BP	± slender BP
Abdominal pattern	BP	BP	BP — obscure dark	obscure pale
Size of AM	variable (allometric growth)	strictly smallest	strictly smallest	smallest
Shape of MOT	long, ± trapezoidal	quadrangular	long, ± trapezoidal	wide trapezoidal
Cheliceral teeth	2 + 3	2 + 2 — 3	4 — 6 + 5 — 7	2 + 3
Labium	long	as long as wide	as long as wide	as long as wide
Apex of sternum	pointed	pointed	pointed	?
Tib. & met. v. sp.	3 + 3	3 — 5 + 3 — 4	3 + 3	4 + 3
Length of calamistrum	2/5 of mt IV	—	1/3 of mt IV	4 — 5 hairs only
Trochanteral notch	wide but rather shallow	deep	wide but rather shallow	?
Palpal tibial processes	apical + basal	apical (+ basal)	apical + subapical	♂ unknown
Patellar boss	lacking	large with numerous ctenidia	small — minute	
Embolus	thin coiled	thin coiled	thin coiled	
Primary conductor	folded falciform lamella	folded falciform lamella	folded falciform lamella	
Secondary conductor	double spoon	long falciform membrane	narrow spoon-shaped	
Anterior tegular apophysis	large acute triangle	curved hook	± reduced	
Shape of tegulum	basally strongly protruding	basally weakly protruding	unmodified	
Shape of epigynal fovea	long oval	variable	wide oval	long oval
Lateral teeth	very long falciform	small — none	long and narrow	long and narrow
Lateral foveae	indistinct	± well developed	small pits	small pits
Vulval structure	complicated	complicated	rather simple	rather simple
Seminal receptacula	large oval	oval	globular	large oval
Special characters	sexual dimorphism in the relative size of eyes		sexual dimorphism in the shape of chelicerae	—
Distribution	S. & C. Neotropical	S. & C. Neotropical	C. Neotropical	C. Neotropical

spaced hair covering, but sometimes these hairs are more densely spaced than elsewhere on the dorsal side of the legs, e.g., in many Macro-*bunine* species. This trend reaches its climax in Amaurobiinae, in which the marginal row of this dorsal hairy area is approximately as regular and as dense as the row which makes up the calamistrum proper. The microstructure of the hairs of this marginal row, however, is typically plumose-laminar, and as such clearly reveals the origin of this biseriate pattern of calamistrum. The regular row of plumose hairs is here called pseudocalamistrum, not to be confused with a similar term used by MELLO-LERTÃO (1915, p. 130) for a row of patellar hairs in the Uloborid genus *Petrunkewitchia*. Cf. also Miturgidae.

Another misunderstanding of the structural features of Amaurobiinae also requires correction here. In keys to Amaurobid genera (e.g., CHAMBERLIN 1947) there is usually a bifurcate division into genera with an entire epigynal plate (*Amaurobius*, *Walmus*) and those with a bilobate plate (*Callobius*, *Callioplus*). In fact, the epigynal plate of all Amaurobine genera is undivided, but in the latter genera it is con-

siderably reduced in size, triangular, and caudally surrounded by enlarged, obtuse lateral teeth, thus corresponding in detail to the basic pattern of Amaurobioidea.

An additional useful character for most Amaurobiinae is the shape and position of the tibial apophyses of the male palpus. In contrast to the basic type of Amaurobioidea, there is regularly a ventral process in addition to latero-apical ones. Besides, all the processes have a more or less rounded base, that is, there is no abrupt dividing line between the tibia and the process, as in the basic pattern of this superfamily. This character of Amaurobiinae is shared by some Miturgid genera (*Raecius* and *Uduba*). The presence of this character is of great assistance in placing the fossil genus *Eomatachia* (cf. p. 324).

Concerning the use of tarsal and metatarsal scopulae or claw tufts as key-characters in a group with repeated parallel adaptations to a vagrant life, I have proved incontrovertibly by the analysis of different characters that there is a gradual change in these characters in each separate evolutionary line towards a vagrant life. Thus the use of such alternative expressions

Table 22. Amauro-

	<i>Tamgrinia</i>	<i>Taira</i>	<i>Amaurobius</i>
Figure	197 – 199	204, 207	196, 201 – 203, 208 – 210
Size	very large – large	medium	very large – medium
Cribellum	large bipartite	♀ large bipartite, ♂ modified	♀ large bipartite, ♂ ± reduced
Pattern and shape of spinn. Apic./bas. segment of PS	thick BP 0.5 – 1	thick BP < 0.5	thick BP < 0.5
Abdominal pattern	obscure BP	wide central band	BP – wide central band
Shape of carapace	pear-shaped	long oval, exceptionally high	pear-shaped, cephalic area short
Fovea	long and rather deep	short and deep	variable longitudinal
Size of AM	> PM	> PM	variable
Shape of MOT	trapezoidal	long, slightly trapezoidal	long trapezoidal – subrect.
Cheliceral teeth	2 + 3	4 + 3	3 – 4 + 4
Labium	long notched	long notched	long notched
Apex of sternum	pointed	pointed	shortly pointed
Tib. & met. v. sp.	3 + 3	3 + 3	3 + 3
Tarsal spines	III – IV: ventral & lateral	III – IV: ventral & lateral	none
Tarsal scopulae	well developed	weak	weak – moderately developed
Pseudocalamistrum	poorly defined	poorly defined	well developed and regular
Basal cymbial excavation	shallow	shallow	± deep
Number of tibial processes	3 (lamellar + fused together)	2 (large basal branched + small lateral subapical)	3 (median 1 – 2-lobate)
Origination of embolus	basal – subbasal	subapical	central – subapical
Shape of embolus	semicircular, basally laminar	thick modified lamella	thick modified lamella
Primary conductor	folded chitinous funnel	wide lamella, dist. truncate	totally reduced
Secondary conductor	thick membrane	wide membranous	wide membranous
Position of sec. conductor	embraces prim. conductor	between prim. cond. & embolus	along the apex of embolus
Median apophysis	large scoop-shaped	long basal hook	lateral, variable in shape
Tegular apophyses	central lamina	subapical obtuse lamina	1 – 2 apical – ectal, ± acute
Epigynal plate	longitudinal septum	protruding caudal plate	transversal – trapezoidal, caudal
Lateral teeth	distinct anterolateral	distinct caudolateral	indistinctly defined lobes
Seminal receptacula	globular	globular	globular
Special characters	epigyne with large pit		♂ legs with long curly hairs
Distribution	E. Palearctic	E. Palearctic	W. Palearctic (+ synanthropic)

as »scopulae and claw tufts present» and »scopulae and claw tufts lacking» is not to be recommended, and numerous intermediate patterns are found in Amaurobiidae und Miturgidae. Naturally, the development of claw tufts is generally linked with that of the ventral scopulae of the apical segments of the legs, as both together are linked with the reduction of spinning habits and certain types of spinning glands. Cf. also the descriptions of patterns of spinning glands in different ecological types of spiders by ATANASIU-DUMITRESCO (1941 a).

My Amaurobiinae is easily divided into two tribes, Amaurobiini and Tairini. The genera *Amaurobius*, *Eomatachia*, *Walmus*, *Callobius*, and *Callioplus* share the reduction of primary conductor, lack of tarsal spines, pattern of tibial apophyses in male palpi, etc., and the pseudocalamistrum is quite distinct, except in *Callioplus*. *Taira* and *Tamgrinia* are deviating in regard to all the characters mentioned above,

and their epigynal structure also more resembles the basic type of Amaurobioidea with distinct lateral teeth. Thus Tairini represents a less specialized branch of Amaurobiinae.

Amaurobiinae is a purely Holarctic group, and the only Cribellate group occupying the corresponding ecological niches in most parts of its range.

Liocranidae

Contrasting to other Amaurobioidean families, the revision of Liocranidae has not yet been completed, although its position as a derivative of Amaurobiidae is undoubted. For other preliminary results, see p. 290.

Agelenidae

The most radical changes resulting from the present revisional work have been in the limitation of the classical family Agelenidae, as far

biidae: Amaurobiinae.

† <i>Eomatachia</i>	<i>Walmus</i>	<i>Callobius</i>	<i>Callioplus</i>
PETRUNKEVITCH (1942)	CHAMBERLIN (1947)	47, 63, 200	64, 205 – 206, 211
medium – small	medium	medium – very large	medium – small
large	large bipartite	large bipartite	trapezoidal with bipartite plate
BP ca. 0.5	BP – thick BP < 0.5	thick BP < 0.5	thick BP < 0.5
?	wide central band – BP	wide central band	BP
cephalic area long and narrow	pear-shaped	pear-shaped, ceph. area short	oval, hind margin ± rounded
short	± triangular	long and wide	short
? subequal to PM	variable	> PM	variable or none
strongly trapezoidal	variable	trapezoidal	long trapezoidal
3 + ?	3 – 4 + 4 – 5	4 + 5	4 – 5 + 2 – 4
long notched	long – as wide as long	long truncate	long truncate
pointed	shortly pointed	pointed	shortly pointed
3 + 3	2 – 3 + 2 – 3	3 + 3	3 + 3
none	none	none	none
? weak	weak	rather well developed	weak
poorly defined?	well developed and regular	well developed and regular	poorly defined
deep	deep	deep	deep
4	3 (median bilobate)	3	3 (median strongly branched)
?	subapical – central	subapical	subapical
lamellar	thick short lamella	thick modified lamella	short folded lamella
?	totally reduced	totally reduced	totally reduced
?	wide membranous	folded membranous	membranous
?	along the apex of embolus	along the apex of embolus	along the apex of embolus
?	thin curved	complicated and large	thick basolateral
?	obtuse bilobate	large obtuse	variable
♀ unknown	narrow transversal – trapezoidal	minute triangular	small ± oval
	anterior ± acute teeth	large lobes, touching	large lobes, touching
	globular	oval	globular
	I tibia of ♂ sometimes with a basal spur		
Baltic amber	Neartic	Holarctic	Nearctic – N. Neotropical – E. Palearctic

as the spiders of the superfamily Amaurobioidea are concerned, although the criteria used for the definition of Agelenidae have not been essentially changed. In my opinion, the Agelenidae of all past and even of quite recent authors is a mere assemblage of three-clawed Araneomorph spiders without cribellum and without any radical modifications of the basic patterns of Amaurobiides – Zodariides either in eyes or in shape and colour of cephalothorax and abdomen. Indeed, these characters are mainly responsible for the general appearance of spiders and, in a merely phenetic classification, this kind of limitation of Agelenidae is almost self-evident. Cf. also the parallel problems of limitation of the other classical family, two-clawed Clubionidae, on p. 290.

From the creation of Agelenidae (C. L. KOCH 1837) up to its first revision (THORELL 1870 a, 1870 – 1873) and, to a lesser extent, until the second revision by SIMON (1897), a large num-

ber of representatives of various Araneomorph families were originally described as Agelenids or later transferred to this family from Drassidae. There were also genera which deviated greatly in general appearance, e.g., *Pholcus*, *Palaestina*, and *Hamataliwa*.

In order to demonstrate the early development of the limitation of Agelenidae, the catalogue of genera revised here (Chapt. III) includes all the genera that have ever been included in Agelenidae. A summary of the changes which took place up to the time of SIMON (1897), and of those made by him, shows clearly that genera that actually belong to families outside Amaurobioidea were largely removed from Agelenidae by the authors of the last century. Most of these genera are now placed in Zodariidae or related families of the branch Zodariides, while the rest have been scattered among Pholcidae, Hersiliidae, Oxyopidae, and Anyphaenidae.

However, the distinctive characters for Zodariidae and Agelenidae have since been treated in an extremely vague way by MELLO-LEITÃO (1917, 1938, 1940 b, 1941 b) and even by some other authors dealing with Neotropical spiders, evidently because true Agelenids are practically unknown in the central and southern parts of the Neotropical region. This fact has also been discussed by ROTH (1965), who transferred several genera to Zodariidae and Linyphiidae and also presented a key-table for the separation of Agelenidae and Zodariidae.

On the other hand, some two-clawed species of Amaurobioidea that were originally described as representatives of the genus *Agelena*, as understood by most authors a century ago, or whole genera that were then listed in Agelenidae (AUSSERER 1867, THORELL 1870 a, HERMAN 1878), were transferred to Clubionidae, far removed from Agelenidae, by SIMON (1898 a) mainly because of the undue emphasis laid on the number of tarsal claws in the limitation of higher groups. These genera are here brought back to the vicinity of Agelenidae, to constitute the Amaurobioidea family Liocranidae (cf. also p. 290 and Fig. 8).

Agelenidae is here defined according to phylogenetic affinities derived from the analysis of all characters that are easy to observe. Fortunately, all my Agelenid genera have a key-combination of three positive characters: the colulus is always paired, three tarsal claws are present, and the posterior pair of spinnerets is more or less lengthened. Besides, most of the Agelenid species are easily placed according to some single, more striking character – abdominal pattern, abundance of feathery hairs, or the type of funnel web constructed by them.

Agelenidae is here divided into two subfamilies only, Ageleninae and Coelotinae, but, by some standards, the nominate subfamily could be further divided (cf. Table 23). However, there is a complicated pattern of parallel trends in this subfamily, and Agelenini, Tegenariini, and Textricini, which are here listed as tribes, may be partly arbitrary groups. F. O. PICKARD-CAMBRIDGE (1893) created Coelotinae, but it has been accepted neither by SIMON (1897) nor by any later author up to date. As regards further division of SIMON's Ageleninae, only HOMANN (1952, 1961 a) and KISHIDA (1955) have since suggested some changes.

A summary of the changes in the limitation of Agelenidae auct. is presented below, to make

it easier to understand any discussion in this paper of the details of this problem. The fundamental principles governing the limitation of Agelenidae have not essentially changed since SIMON (1897), and so the concise catalogue of ROEWER (1954 a, p. 35 – 99) has been chosen as a yardstick for comparisons. As detailed information about the results of the revision can be found in Chapter III, only the changes in the placing of genera, defined according to their generotypes, are traced here. The synonymization and relimitation of genera have not been taken into account in compiling this summary. However, the presence of some «dump» genera of Agelenidae is worth mentioning here, viz. *Rubrius*, *Myro*, *Tettilus* and *Cybaeus*, each of them including representatives of three different subfamilies still in the catalogues of both ROEWER (1954 a) and BONNET (1945 – 1961). Cf. also the Cribellate «dump» genera *Auximus* (p. 217) and *Amaurobius* (p. 202).

ROEWER's catalogue of Agelenidae lists 76 genera, classified in three subfamilies, Ageleninae (42), Cybaeinae (32), and Rhoicininae (2). Sixteen genera of his Ageleninae and four of Coelotinae are here accepted as representatives of the same subfamily, that is, only one fourth. Not a single genus of his Cybaeinae and Rhoicininae has here been left in Ageleninae, because each shows evident phylogenetic affinities with other families.

The genera transferred to other families are distributed as follows:

Thaidoidea

Thaididae – Cybaeinae: *Thaida*

Zodarioidea

Zodariidae s. lat. – Cybaeinae: *Cybaeodamus*, *Cyrioclea*, *Ishania*, *Mevianops*, and *Valcheta* (cf. ROTH 1965)

Corinnidae – Cybaeinae: *Cycals*

Amaurobioidea

Miturgidae: Machadoniinae – Cybaeinae: *Campostichomma* and *Phanotea*

– Amaurobioidinae – Cybaeinae: *Pacificana* (FORSTER 1955 a)

Amaurobiidae: Matachiinae – Ageleninae: *Cicirra*

– Desinae – Ageleninae: *Corasoides*; Cybaeinae: *Cedicus*, *Desis*, *Myro*, *Ommatauzesis*, and *Porteria*

– Rhoicininae – Ageleninae: *Barrisca* (cf. ROTH 1965); Rhoicininae: *Rhoicinus* (cf. EXLINE 1950)

– Macrobuninae – Ageleninae: *Hicanodon* and *Neoporteria*; Cybaeinae: *Chresiona*, *Emmenomma*, *Pionaces*, and *Rubrius*

– Altellopsinae – Rhoicininae: *Rhoicinaria*

– Amaurobiinae – Cybaeinae: *Cybaeopsis*

Dictynidae: Tricholathysinae – Ageleninae: *Mizaga*, *Saltonia*, and *Halocryphoea*; Cybaeinae: *Desidiopsis*

– Cybaeinae – Cybaeinae: *Cybaeina*, *Cybaeota*, *Cybaeozygga*, and *Cybaeus*

- Cicurinae - Ageleninae: *Blabomma*, *Chorizomma*, *Chorizommoides*, *Cicurina*, *Tetrilus*, and *Yorima*
- Hahnidae: Cryphocinae - Ageleninae: *Calymmaria*, *Cryphoea*, *Ethobuella* and *Tuberta*
- Cybaeolinae - Ageleninae: *Mevianes*; Cybaeinae: *Cybaeolus*
- Incertae sedis - Cybaeinae: *Symposia*
- Lycosoidea
- Zoridae - Cybaeinae: *Vagellia* and *Zoica*
- Pisauridae
- Pisauridae - Cybaeinae: *Campostichommides*
- Araneidae
- Araneidae: Metinae - Cybaeinae: *Auchicybaeus* (GERTSCH & IVIE 1936)
- Linyphiidae: «Erigoninae» - Ageleninae: *Asemostera* and *Pelidida* (ROTH 1965)
- Mynogleninae - Cybaeinae: *Mynoglenes* and *Paro* (cf. HICKMAN 1939)
- Incertae sedis - Ageleninae: *Coreidon*

Since the publication of ROEWER's catalogue 23 new Agelenid genera have been created, and *Moguracicurina* (KOMATSU 1947) was neglected by ROEWER (*op. cit.*). Their revised position is summarized below:

- Agelenidae: *Iamatega*, *Iwogumoa*, *Neotegenaria*, *Ommathadites*, *Pireneitega*, *Pseudoceras*, *Sabitega*, *Tubitega*, and *Urobia* (for revised status, see Chapt. III)
- Amaurobiidae: Desinae: *Gasparia*, *Hina*, *Huara*, and *Naevius*
- Macrobuninae: *Livius*, *Olybrius*, *Urepus*, and ? *Virgilus*
- Dictynidae Litisedinae: *Litisedes* and *Swainsia*
- Cicurinae: *Ameromma* and *Moguracicurina*
- Hahnidae Cryphocinae: *Gillayia* and *Paratetrilus*
- Cybaeolinae: *Lizarba*

The previous placing of most of the genera listed above is difficult to understand, as they do not generally have the same classical key-characters as Ageleninae and Cybaeinae - lengthened posterior spinnerets, and short, conical spinnerets, respectively. As a curiosity it may be mentioned here that the same genus has often been described in both subfamilies (*Hicanodon* & *Rubrius*, *Mevianes* & *Cybaeolus*, *Mizaga* & *Desidiopsis*). In the case of *Mizaga*, the same species has been chosen as the generotype of two genera, in Ageleninae and Cybaeinae (*Halocryphoea veneta* and *Desidiopsis racovitzae*).

The only explanation for this chaotic classification of Agelenidae by all previous authors may be their inordinate trust in the authority of those arachnologists who have described a large number of species.

Ageleninae

The nominate subfamily of Agelenidae as limited here is characterized by the dense fun-

nel or sheet web, distinct reddish dorsal folium of the abdomen, and abundance of feathery hairs. However, none of these is suitable as a key character, because there are considerable modifications of this basic pattern in some species and genera. In the male genital organs there are more or less distinct trends in each of the three tribes (Tables 25 - 27), and when the characters mentioned above deviate, the genital pattern generally aids in placing the genera. Thus there are no genera that cannot be more or less accurately placed.

The tribe Agelenini is strongly represented in Nearctic, Palearctic, and Ethiopian faunas, while the two remaining tribes, Tegenariini and Textricini, seem to be mainly concentrated around the Mediterranean. Some species of *Tegenaria* have spread synanthropically almost all over the world, while Agelenids seem to be lacking in the original fauna of the Australian region and in large parts of the Neotropical.

The gregarious habits of Amaurobiidae have evolved independently along several different lines. Cf. also RAINBOW (1905), SIMON (1908, 1909 b), and KASTON (1964). At least in *Mallos*, there are both solitary and social species in the same genus. The social habits of *Agelena consociata* Denis 1964, which is here included in the genus *Mistaria*, have been described in detail by PAIN (1964) and DARCHEN (1964), and even some species of the well-known *Tegenaria* are semi-social. Thus it seems obvious that the adaptation to social life need not be a result of abrupt adaptive radiation, but rather the climax of successive evolution.

The tribe Agelenini can be further divided into groups of closely related genera. The largest group consists of *Hololena*, *Mistaria*, *Novalena*, *Rualena*, *Calilena*, *Benoitia*, and *Agelenella*, at least, while the genera *Agelena* and *Olorunia* are more loosely related to them. This group is characterized by a well-developed primary conductor which, however, in some genera, has lost its original function as a support for the embolus (see Table 25). In these genera there is an additional distal lamella, originating in the tegulum, which has been called the fulcrum since CHAMBERLIN & IVIE (1942 a). This fulcrum is always analogous with the basic type of conductor, but evidently non-homologous with the secondary conductor of the male palpus of Amaurobiidae, Miturgidae, Liocranidae, and the whole superfamily Lycosoidea as defined in this paper. In direct contrast to

Table 23. Groups of Agelenidae.

	Ageleninae				Coelotinae
	Agelenopsini	Agelenini	Tegenariini	Textricini	
Abdominal pattern PS: apic./bas. segment	<i>Agelena</i> -type usually >	<i>Agelena</i> -type usually >	BP – none usually ≤	BP – <i>Agelena</i> -type usually ≪	BP – none variable
Pattern of carapace	lat.(+ centr.) bands	lat. (+ centr.) bands	usually absent	variable	lateral bands – none
Feathery hairs on carap.	abundant	present	absent (- scarcely)	absent	absent
Modific. of ceph. area	very distinct	usually distinct	absent	distinct	absent
Anterior eye row	strongly procurved	strongly procurved	± straight	recurved	± straight
Shape of MOT	rectangular	usually long rectangular	usually trapezoidal	usually wide trapezoidal	variable
Cheliceral armature	usually 3 – 4 + 3	usually 2 + 3	very variable (4 – 8 + 3 – 5)	2 – 3 + 3	usually 3 + 3
Labium	wide	wide	wide	wide	usually long, notched
Sternal pattern	central light area – none	central light stripe – none (<i>Rualena</i> : <i>Tegenaria</i> - type)	complicated – none	central light area – none	usually none
Feathery hairs on legs	abundant	abundant	abundant – none	none	none
Cymbial modifications	apex + slight basal	usually none	apex – none	slight basal	lateral groove
♂-p/: patellar modificat.	insignificant	small dorsal process	variable	dorsal process – thicken.	lateroapical process
Type of embolus	strongly modified	short curved spine	BP	long – BP	long – BP
Primary conductor	± separate, furrowed sclerite	rigid apical	lateral folded lamina	very complicated lateral – basal sclerite	apical – lateral folded lamina
Median apophysis	usually ± reduced	variable	usually basal hook	usually ± reduced	usually scoop-shaped
Fulcrum	thick furrowed sclerite – absent	laminar – fused to conductor	absent	absent	absent
Tegular apophysis	large basal	small – none	none	none	none – small lamina
Epigyne	variable	variable	variable	variable	variable
Special characters			trochanterae sometimes notched (<i>Malthonica</i> , <i>Histocona</i>)		tarsal scopulae sometimes ± developed
Distribution	Nearctic – N.Neotropical	Holarctic – Ethiopian	Palaearctic (+ synanthr.)	Palaearctic – Oriental	Holarctic

Table 24. Ageleninae: Agelenopsini¹.

	<i>Ritalena</i>	<i>Melpomene</i>	<i>Agelenopsis</i>	<i>Tortolena</i>	<i>Barronopsis</i>	<i>Philoicides</i>
Figure	CHAMBERLIN & IVIE (1941, Fig. 84)	249, 250, 252	248; CHAMBERLIN & IVIE (1941)	251	CHAMBERLIN & IVIE (1941)	MELLO-LEITÃO (1944 Fig. 21)
Size	large	medium - large	medium - large	medium	medium	medium
PS: apic./bas. segment	1.5	0.5 - 2	1 - 2	1 ½	2	1
Pattern of carapace	3 wide light bands	2 - 3 light bands	3 obscure bands	distinct lateral bands	3 obscure bands	?
Cheliceral teeth	3 + 3	3 - 5 + 3	3 - 4 + 3	4 + 3	3 - 4 + 3	4 + 3
Size of AM	> PM	subequal to PM, < AL	> PM, largest	subequal to PM, < AL	> PM	≪ PM
Shape of MOT	long rectangular	long, ± rectangular	± quadrangular	± quadrangular	?	?
Tib. & met. v. sp.	2 + 3	2 - 3 + 3 (± irregular)	2 - 3 + 3	3 + 3	2 - 3 + 3	2 + 2
Tarsal spines	III - IV: 1 - 3	III - IV: 2 - 4	none	III - IV: 0 - 3	none	?
Cymbial modifications	practically none	basal boss (+ long apex)	long apex	very long apex	long apex	♂ unknown
Tibial processes	1 large triangular	1 - 2 (- 3) triangular	simple apical lobe	simple carina	apical lobe	
Origination of embolus	apical	apical - subapical	central - apical	central	apical	
Shape of embolus	transversal coiled spine	S-shaped, + lamella	large circular lamella	folded lamella in double coil	apical furrowed spiral	
Primary conductor	bilobate furrowed sclerite	bilobate furrowed sclerite	furrowed sclerite	subcircular plate with central stalk	small, apex notched	
Median apophysis	widely triangular	triangular	strongly reduced	totally reduced	totally reduced	
Tegular apophysis	large, with excavation	large	insignificant	pointed	large	
Terminal apophysis	three separate lobes	large furrowed lobe & small triangular lobe	fused to embolus	2 falciform hooks under embolus	?	
Epigynal pit	unpaired longitudinal	large reniform	transversal narrow oval	anterior with double spir.	transversal oval	reniform
Epigynal plate	weakly limited	longitudinal septum	small caudal bar	caudal triangular	weakly limited	? none
Lateral teeth	unpaired anterior	anterior - none	central	none	central	none
Distribution	W. Nearctic	W. Nearctic - N. Neotropical	Nearctic	N. Neotropical - W. Nearctic	N. Neotropical - W. Nearctic	C. Neotropical

¹ For *Neotegenaria*, see p. 252.

Table. 25 Agelenidae

	<i>Tikaderia</i>	<i>Agelena</i>	<i>Agelenella</i>	<i>Olorunia</i>	<i>Kidugua</i>
Figure	212	216, 221	217	214, 215	218
Size	medium	very large – medium	medium	medium	medium
Colulus PS: apic./bas. segment	paired triangular plate $\frac{3}{4}$	paired tubercle 1 – 2	paired hairy plate $1\frac{1}{4}$	paired group of setae 1 – $1\frac{1}{2}$	paired hairy plate $1\frac{1}{4}$
Abdominal pattern	obscure central band	reddish-brown central band	light central band	light BP	light BP
Pattern of carapace Fovea	three narrow bands short and deep	lateral bands – none very large	lateral bands long and rather narrow	obscure lateral bands short	distinct lateral bands short and deep
Cheliceral teeth Size of AM	6 + 5 < PM	2 – 3 + 3 subequal to PM	2 + 3 > PL > PM	2 – 4 + 3 – 5 subequal to PM, $\geq$ PL	4 + 3 < PM
Shape of MOT Labium	trapezoidal as long as wide	quadrangular wide	long rectangular very wide	long subrectangular wide	long subrectangular wide
Tib. & met. v. sp. Tarsal spines	1 – 2 + 3 IV: 1 – 2 apical	3 + 3 – 6 ($\pm$ irregular) III – IV: numerous	2 + 3 ($\pm$ irregular) III – IV: 1 – 2	2 + 3 IV: 1 – 2	2 + 4 IV: 1 – 3
Cymbial modific.	(δ unrevised)	basal angle – none	δ unknown	basal boss	δ unknown
Tibial processes		2 simple apical		ventral carina	
Patellar processes Orig. of embolus		apical lobe subapical – central		rounded lamina subapical	
Shape of embolus		spiral lamella		thick spine	
Primary conductor		large and thick (branched)		transversal apical fold	
Median apophysis		finger-shaped – reduced		bumerang-shaped	
Fulcrum (*terminal apophysis*)		variable (– fused to conductor)		fused to conductor	
Functional con- ductor		prim. conductor (+ fulcrum)		primary conductor	
Epigynal pit	none	large, $\pm$ rounded	transversal oval	paired oval	reniform, with double spiral
Epigynal plate Lateral teeth	narrow transversal absent	weakly limited absent	none absent	longitudinal septum absent	caudal trapezium absent
Special characters	sternum with distinct anterior folium; ocular area with white hairs		legs very distinctly annulated	sternum with central light stripe	
Distribution	Himalaya (? – Orien- tal)	Palaearctic	Ethiopian (Socotra)	C. & S. Ethiopian	C. Ethiopian

this latter structure, the shape and place of insertion of the fulcrum are highly variable even within a single genus.

The other group consists of *Agelenopsis*, *Barronopsis*, and *Melpomene*. The fourth Nearctic – Neotropical genus, *Tortolena*, seems to be most closely related to the Ethiopian *Kidugua*, and both might be included in this group, which is generally characterized by strange modifications of all the main parts of the male palpal organs. In *Agelenopsis* and *Barronopsis*, the embolus is lamellar and self-supporting; the median apophysis has become more or less reduced. In *Melpomene*, there are sometimes fulcrum-like processes in addition to a well developed conductor. The whole group is further characterized by a more or less projecting basal horn in the tegulum.

The long, tight coil of the embolus in *Tortolena* and *Kidugua*, with a corresponding spiral furrow in the epigyne, could be a result of parallel evolution, as there are numerous cases of convergence in other superfamilies (JÄRVI 1912: Sparassidae; SIMON 1892 a & others: Dinopidae; MELLO-LEITÃO 1936 a: Ctenidae; DENIS 1953: Gnaphosidae; R. MARPLES 1959: Dictynidae – here Macrobininae).

The genera *Neotegenaria* and *Philoicides* are insufficiently known, and they cannot be exactly placed yet.

The large genus *Tegenaria* of the tribe Tegenariini (Table 23) seems to represent the basic pattern of Agelenidae better than any other genus of this tribe, and probably the whole tribe Agelenini can also be derived from common ancestors with *Tegenaria*. In the remaining

Ageleninae, Agelenini.

<i>Mistaria</i>	<i>Benoitia</i>	<i>Calilena</i>	<i>Hololena</i>	<i>Novalena</i>	<i>Rualena</i>
227, 230	213	219 – 220	222, 224	223, 225	226, 229
large – medium	very large – large	large – medium	medium – large	medium – large	medium
paired hairy plate $\frac{1}{2}$ – $1\frac{1}{2}$	paired hairy plate 2 – $2\frac{1}{2}$	paired hairy plate $1\frac{1}{2}$ – 2	paired hairy plate $\frac{1}{2}$ – $\frac{3}{4}$	paired hairy plate $\frac{1}{2}$ – 1	paired tubercle $\frac{3}{4}$ – 1
reddish-brown central band	light band	light band + dark anterior folium	light band	obscure	light band
obscure lateral bands long and deep	3 light bands very long, rather deep	wide centr. + lat. bands long and deep	3 wide bands long and deep	narrow lateral bands short	three bands short
$2 + 3$ $\leq$ PM	$2 + 3$ $>$ PM	$2 + 3$ subequal to PM	$2 + 3$ $>$ PM	$2 - 3 + 3$ $\geq$ PM	$2 + 3$ subequal to PM, $\ll$ AL weakly trapezoidal wide
long rectangular as long as wide – wide	long rectangular wide	long rectangular wide	ant. wide trapezium as long as wide	long rectangular wide	
$3 + 2 - 3$ III – IV: 0 – 2	$2 + 3$ none	$3 + 3$ III – IV: 0 – 3	$3 + 3$ III – IV: 1 – 2	$3 + 2 - 3$ III – IV: 1 – 3	$3 + 3$ (strong) III – IV: 0 – 3
none	apex long	none	apex very short	basal boss	none
1 (– 2) long apical + mesal lobe acute apical basal – central	ventral carina 2 small apical basal	3 lateroapical laminar none subbasal – central	2 branched lateral none central – subapical	complicated lateral + apical none subapical – central	2 lateroapical none subapical
BP or shortened	large coil	short and thick spine	S-shaped, distinctly modified	horn-shaped	short semicircular
distally tapering plate	large screw	pointed apical	complicated apical	wide apical lamella	obtuse apical
narrow, apically curved	very small membra- nous	scoop-shaped	thick lateral la- mella	scoop-shaped	long scoop-shaped
pointed, well scler- otized	partly fused to con- ductor	long, distally tapering	membranous	fused to conductor	partly fused to conductor
prim. conductor + fulcrum	primary conductor	fulcrum	fulcrum	prim. conductor (+ fulcrum)	fulcrum (+ prim. conductor)
$\pm$ horseshoe-shaped	paired foveae	$\pm$ oval	transversal oval	narrow transversal	$\pm$ oval
weakly limited usually present	caud. tapering septum rounded lobes	sexangular long unpaired	weakly limited pointed caudal – central	variable central	caudal transversal short lateral
gregarious		carapace not anteriorly raised		legs rather short	sternum with pat- tern of <i>Tegenaria</i> - type
Ethiopian	C. Ethiopian	W. Nearctic	W. Nearctic – N. Neotropical	W. Nearctic – N. Neotropical	S. Nearctic – N. Neotropical

genera, there is a tendency towards reduction of feathery hairs. These are very scanty in *Malthonica*, *Pseudotegenaria*, and *Histopona*, and totally lacking in those representatives of *Hadites* that have been examined by myself. The latter genus is quite exceptional in general appearance owing to adaptation to cave life, and there has been some difficulty in placing it. However, the structure of both male and female genital organs shows a relationship to *Histopona* which also occupies the same geographical area. If the interpretation of KRATOCHVIL (1938) of the specific rank of the different forms described in the subgenus *Roe-weriana* is correct, there has been an exceptionally high rate of evolution and effective isolation between these completely allopatric, but adjacent populations.

Representatives of *Malthonica* are smaller than any other Agelenids, but the structure of their genital organs shows affinities with *Tegenaria*. The presence of a trochanteral notch is unique in *Malthonica* and most species of *Histopona* among Agelenids, and at the same time an additional proof that the structure of trochanterae cannot be used as a key character for Agelenidae. Cf. PETRUNKEVITCH (1928), EXLINE (1950), HOMANN (1961 a), and ROTH (1964) for different opinions.

Textricini is the most compact of the tribes of Agelenini (Table 27). Representatives of this group strikingly resemble Lycosids in the field, and some of them were, in fact, originally included in Lycosidae, e.g., by H. LUCAS (1846). Elevation of the cephalic area is not unique in Textricini among Agelenids, but the colour

Table 26. Agelenidae: Ageleninae, Tegenariini.

	<i>Malthonica</i>	<i>Tegenaria</i>	<i>Pseudotegenaria</i>	<i>Histopona</i>	<i>Hadites</i>
Figure	234	49, 231 and LOCKET & MILLIDGE (1953)	228, 232	233; SIMON (1937, Fig. 1530)	KRATOCHVIL (1938)
Size	medium – small	very large – medium	medium	medium	medium – large
Colulus	strongly reduced	paired triangular plate	paired hairy plate	paired triang. plate	paired hairy plate
Apic. segm. of PS	$\frac{1}{2}$ basal segment	$\frac{1}{2}$ – 2 basal segment	basal segment	$\leq$ basal segment	1 – $1\frac{1}{2}$ basal segment
Abdominal pattern	obscure (basic type)	BP – none	none (– obscure BP)	simple basic type – obscure	none
Pattern of carapace	obscure lateral bands	lateral bands – none	none	none	none
Fovea	short and shallow	deep, variable length	deep, usually short	short deep	short deep
Cheliceral teeth	5 + 5	5 – 8 + 3 – 4	4 – 6 + 2 – 3	4 + 3	4 – 7 + 3
Size of AM	< PM (PM strictly largest)	variable, usually PM	PM	> PM	minute (or all eyes lacking)
Shape of MOT	wide trapezoidal	usually long rectangular	trapezoidal	strongly trapezoidal	wide trapezoidal
Labium	wide	variable, often long	wide – as long as wide	as long as wide	as long as wide
Apex of sternum	rounded but projecting	pointed	pointed	pointed	gradually narrowed
Tib. & met. v. sp.	2 + 2	(2–) 3 + 3 – 4	3 + 4 – 4	3 + 3	3 + 2 – 3
Tarsal spines	none	usually present (2 – 5)	none	usually none	none
Feathery hairs	sparsely	abundant (– sparsely)	quite sparsely	sparsely	absent
Cymbium	unmodified	apex often long	apex often long	apex very long	apex very long
Tibial processes	2 short lateroapical	1 – 3 apical	1 – 3 central (– apical)	2 apical + 1 mediobasal	2 apical laminae
Patellar processes	none	none	none	large branched	none
Origination of embolus	subbasal	central – subbasal	basal – subbasal	central – apical	basal
Shape of embolus	semicircular	thin, $\pm$ semicircular	thin, $\pm$ semicircular	very long spiral	circular + apical coil
Primary conductor	mediobasal lamina	folded longitudinal lamina	folded longitudinal lamina	very large lamina	folded longit. lamina
Median apophysis	basal, finger-shaped	basal, finger- or hook-shaped	basal hook	none	narrow basal
Epigynal pit	none	variable	practically absent	large with thin integument	none
Epigynal plate	caudal bar	variable	transversal caudal	weakly defined – triangular	caudally $\pm$ constricted
Lateral teeth	absent	often present	absent	absent	absent
Special characters	met. with 2 long trichob.; troch. moderately notched; tarsi with 3 trichob. only	sternum often with a central folium and lateral spots, trochanterae sometimes notched (<i>T. ligurica</i>)	eye rows $\pm$ recurved; eyes relatively small	complicated pattern of tegular apophyses and carinae; trochanterae $\pm$ notched	cavernicolous
Distribution	Western Mediterranean – C. Ethiopian	Palaearctic, synanthropically cosmopolitan	Mediterranean	Mediterranean	E. Mediterranean

Table 27. Agelenidae: Ageleninae, Tetricini.

	<i>Tetricix</i>	<i>Lycosoides</i>	<i>Maimuna</i>
Figure	LOCKET & MILLIDGE (1953)	241, 246	245, 247
Size	medium	medium	large - medium
PS: apic./dist. segment	(1 -) 2	1 ½ - 2	1 ½ - 2
Abdominal pattern	<i>Agelena</i> -type	obscure BP	BP - <i>Agelena</i> -type
Pattern of carapace	central light band	obscure - none	longitudinal bands - none
Profile of carapace	distinctly notched	slightly notched	distinctly notched
Cheliceral teeth	2 + 3	2 - 3 + 3	2 + 3
Size of AM	< PM	< PM	< PM
Shape of MOT	wide trapezoidal	variable	trapezoidal
Labium	wide	wide rounded	wide - as long as wide, notched
Tib. & met. v. sp.	2 + 3	2 + 3	2 + 3
Tarsal spines	absent	III - IV: 1 - 2 subapical	IV: 1 - 2 central - subapical
♂-p: tibial processes	variable	large subapical	ventral carina
Patellar processes	small apical	long apical	absent
Type of embolus	BP	± laminar	BP
Primary conductor	longitudinal folded lamina with basal hook	complicated biramous lamina with basal hook	complicated triramous lamina, central part furrowed
Median apophysis	totally reduced	± totally reduced	totally reduced
Epigynal pit	heart-shaped	anterior transversal	large unpaired anterior
Caudal epigynal plate	tongue-shaped	transversal	absent
Lateral teeth	absent	practically absent	lateral lobes (± fused)
Special characters	-	epigyne with a central tongue	conductor embraces palpal tibia; palpal femora modified
Distribution	Mediterranean - Oriental	Mediterranean - Oriental	Mediterranean - Ethiopian

pattern and length of legs in *Tortolena* and *Melpomene* give them a distinctly different habitus.

HOMANN (1961 a) emphasized the different histological structure of the indirect eyes in his Tetricinae and in other Agelenids. Therefore he transferred Tetricinae to Hersiliidae. This procedure has already been severely criticized by ROTH (1963). It is only a matter of opinion whether Tetricini must be called a tribe or a separate subfamily.

The species that are generally included in the genus *Tetricix* seem to represent three distinct groups that are here treated as separate genera, and most of the Oriental representatives of Ageleninae belong to one of these, although they were originally described as representatives of other Agelenid genera.

Coelotinae

Although the separation of Coelotinae by F. O. PICKARD-CAMBRIDGE (1893) has not been upheld by later authors, the genera *Coras*, *Wadotes*, and *Urobia* have usually been placed

in the vicinity of *Coelotes* (cf., e.g., CHAMBERLIN 1925, MUMA 1946 and 1947, KOMATSU 1957).

Representatives of this subfamily strongly resemble those of the Cribellate genus *Amaurobius* in general appearance and also in habits, because their sheet web is reduced to a mere dwelling tube. Consequently, former authors repeatedly confused *Coelotes* and *Amaurobius*, and a complicated nomenclatory problem also resulted (cf. p. 212).

The Amaurobid genera *Taira* and *Tamgrinia* closely resemble Coelotine spiders in regard to general appearance and even to the female genital organs.

The Coelotine genera are further characterized by strange modifications of the cymbium. However, a large lateral furrow, strongly resembling that of some Oriental species of *Coras*, is also present in the Machadonine genus *Camposi-chomma* from Ceylon, as well as in all representatives of the nominate subfamily of Miturgidae, though a detailed analysis of other characters reveals that the cymbial similarity is caused by parallel trends only.

Table 28. Agelenidae: Coelotinae.

	<i>Coelotes</i>	<i>Coras</i>	<i>Wadotes</i>
Figure	235 – 236, 289 – 240, 214	237, 242	238, 243
Size	large – medium	large – medium	large – medium
Colulus	paired–divided hairy plate	paired hairy plate	divided hairy plate
PS: apic./bas. segment	$\frac{1}{2}$ – 2	1 – 1 $\frac{1}{2}$	1 – 1 $\frac{1}{2}$
Abdominal pattern	BP – none	BP – obscure	obscure
Pattern of carapace	none (– lateral bands)	3 longitudinal bands	obscure bands – none
Size of AM	variable (> PM – absent)	> PM	variable
Shape of MOT	usually $\pm$ quadrangular	$\pm$ quadrangular	variable
Cheliceral teeth	3 + 3	3 + 3	2 – 4 + 3
Labium	variable	long notched	long notched
Tib. & met. v. sp.	3 + 3	3 + 3	3 + 3
Tarsal spines	III – IV: ventr. & lateral	III – IV: ventr. & lateral	III – IV: ventr. & lateral
Tarsal scopulae	sparse – moderate	moderate	sparse – moderate
Cymbial modifications	lateral furrow	lateral furrow	lateral furrow + basal processes
Tibial processes	2 – 3 short distal	2 short distal	2 distal
Patellar processes	large – none	short branched	1 – 2 distal
Origination of embolus	basal – central	basal	basal
Shape of embolus	semicircular, basally laminar, distally thin	semicircular laminar	semicircular thin
Primary conductor	folded lamina	folded lamina	triramous complicated sclerite
Median apophysis	double scoop-shaped	scoop-shaped	scoop-shaped
Tegular apophysis	none (tegulum small)	none (tegulum small)	variable small
Fulcrum	fused to conductor	narrow pointed	fused to conductor
Epigynal pit	variable (– indistinct)	indistinct	variable
Lateral teeth	variable central – anterior	long anterior	unpaired anterior tongue
Special characters		-	cheliceral margin oblique; legs short
Distribution	Holarctic	Nearctic	Nearctic – E. Palearctic

Dictynidae

The present definition and limitation of Dictynidae is radically different from all other authors'. The most striking difference in opinion is the inclusion in Dictynidae of several Ecribellate groups which have previously been assigned to the subfamily Cybaeinae, and, in the case of some genera, even to the subfamily Ageleninae. However, their basic pattern of both male and female genitalia is exactly the same as that of the classical Dictynids s. str., and the reduction of cribellum to colulus can be traced in certain lines of evolution (*Devade – Mizaga, Brommella – Cicurina*), parallel to those listed under Miturgidae and Amaurobiidae (cf. Table 8 and Fig. 11).

The inclusion of *Argyroneta* in Dictynidae has been necessary since the influence of purely adaptive modifications, parallel to those of other semi-aquatic spiders, has been taken into account.

There is a general trend towards smaller size in Dictynidae, but some rather large species also occur in *Cybaeus* and *Cicurina*. The reduc-

tion of spinulation on legs, tarsal trichobothria, and fovea is more or less correlated to the reduction of size everywhere in Amaurobioidea, and thus these characters cannot be used in definition or as key characters for any grouping above the generic level.

Dictynidae is here divided into six subfamilies (Table 29). Tricholathysinae and Dictyninae together comprise most of the genera previously included in Dictynidae, and they are rather closely related. The genera *Lathys*, *Atelolathys*, and *Brommella* have here been transferred to Cicurinae, while there are no known Cribellate representatives in the remaining subfamilies, Cybaeinae, Litisedinae, and Argyronetinae.

The list below summarizes the placing of those Dictynid genera in ROEWER's catalogue that have here been transferred to other families.

ROEWER listed 36 Dictynid genera in an undivided family. Eight of them are here listed in the nominate subfamily, seven in Tricholathysinae, and four in Cicurinae, while about half of them (16) are distributed among the three main branches of the suborder:

Table 29. Dictynidae: subfamilies.

	Cicurinae	Litisedinae	Cybaeinae	Argyronetinae	Tricholathysinae	Dictyninae
Size	minute – medium	small – medium	minute – large	large	minute – medium	minute – medium
Cribellum – colulus	cr: undivided co: semicircular – reduced	co: large semicircular	co ± reduced (– transversal)	co: hairy knob	cr: undivided co: semicircular	cr: variable bipartite or undivided
Pattern of spinnerets	wide BP	wide BP, all long and slender	BP (– wide BP)	thick BP	BP – wide BP (shape variable, ± slender)	wide BP
Abdominal pattern	BP – simple BP – none	none	BP – simple BP – none	none (dark grey)	obscure simple BP – none	± modified BP – none
Fovea	longitudinal – none	longitudinal	longitudinal	none (! cf. total size)	(longitudinal –) none	none
Size of AM	usually ± reduced	$AL > AM = PL$ $\geq PM$	$\leq PM$	< PM	variable, often < PM	all eyes often ± subequal
Cheliceral armature	0 – 6 + 2 – 5	6 – 8 subequal + 3 large	quite variable + 3	2 + 3 (all large, widely spaced)	2 – 4 + 3 – 5	variable, usually 0 – 2 + 2 – 3
Cheliceral modifications	<i>Lathys</i> : strong sexual dimorphism	♂♀ long, groove very long	unmodified	very strong	<i>Mizaga</i> : ♂♀ long diverging	± distinct sex. dimorphism
Pattern of carapace	absent	absent	absent	absent	absent	longitudinal rows of white hairs (+ lat. chalk bodies)
Leg spinulation	BP or ± reduced	BP	BP	I – II: reduced, III – IV: abundant	(BP –) ± reduced	(strongly reduced –) absent
Tarsal trichobothria	BP – 2, seldom 1	short and indistinct (2 – 5)	BP – 2	2 ± irregular rows	BP – 2, seldom 1	0 – 1, seldom 2 short
♂ palpal tibia	variably modified	lateral + median apical process	simple lateroapical carina	lateroapical pit	± obtuse lateroapical lobe	usually 1 process with ctenidia
Palpal patella	modified – unmodified	unmodified	modified – unmodified	unmodified	unmodified	modified – unmodified
Embolus	thin ± circular	thin ± circular	thin circular (– short)	thin semicircular	thin ± circular	thin ± circular (– modified)
Primary conductor	caudally directed	caudally directed	caudally directed	caudally directed	caudally directed	caudally directed
Secondary conductor	absent	absent	absent	absent	absent	absent
Median apophysis	absent	absent	absent	absent	absent	absent
Epigynal foveae	unpaired – 1 pair	1 pair	unpaired – 1 pair	indistinct	1 pair	usually 2 pairs
Vulval structure	complicated (– simple)	rather simple	simple (– complicated)	very simple	usually very simple	usually rather complicated
Special characters	–	–	–	hair covering long and dense	abdomen elongated	marked sexual dimorphism, often in shape of abdomen, carapace and maxillae
Ecological range	usually terricolous	intertidal	usually terricolous	inland waters	terricolous (– intertidal)	usually in the vegetation
Distribution	Holarctic – N. Neotropical & Oriental	Australian – E. Palearctic	Holarctic	Palaearctic	Holarctic – C. Ethiopian	world-wide (? except Madagascar)

Table 30. Dictynidae: Cicurinae.

	<i>Brommella</i>	<i>Cicurina</i>	<i>Blabomma</i>	<i>Yorima</i>	<i>Lathys</i>	<i>Atelolathys</i>
Figure	255 – 256	253, 260 – 263; CHAMBERLIN & IVIE (1940)	CHAMBERLIN & IVIE (1937)	251; ROTH (1956 a)	51, 257 – 259, 264, 266; CHAMBERLIN & GERTSCH (1958)	265
Size	minute – small	large – minute	small – medium	small – medium	minute – small	minute
Cribellum – colulus	cr: small undivided	co: transversal – setae only	co: $\pm$ semicircular	co: $\pm$ reduced	cr: small undivided	cr: long semicircular
Apic./bas. segment of PS	$\leq \frac{1}{2}$	$\leq \frac{1}{2}$	$< \frac{1}{2}$	$> \frac{1}{2}$	$\leq \frac{1}{2}$	$\leq \frac{1}{2}$
Abdominal pattern	none	BP – none	obscure – none	simple BP	simple BP – none	spotted light BP
Shape of carapace	pear-shaped	pear-shaped	long pear-shaped	long oval – pear-shaped	short pear-shaped	wide pear-shaped
Fovea	oval depression	long and narrow	long and narrow	long and narrow	none	none
Size of AM	equal to PM – none	$< PM$ – none (or eyeless)	none – minute	none	minute – none	none
Shape of MOT	trapezoidal	trapezoidal	long trapezoidal	–	variable	–
Cheliceral teeth	(0 –) 3 – 5 + 2 – 4	4 – 10 + 3	3 + 2	3 +) denticles + 3	3 – 6 + 4 – 5	4 + 2
Labium	very wide	variable	as long as wide	as long as wide	variable, δ : usually longer than φ	semicircular
Apex of sternum	wide, obtuse angle	pointed	pointed	pointed	wide, $\pm$ rounded	widely pointed
Patellar spines	2 distinct – none	1 – 2 weak bristles	2 distinct	2 long and thin bristles	2 distinct – none	2 distinct
Tib. & met. v. sp.	none – weak bristles	3 + 3	2 + 3	2 + 3	1 – 2 + 2 – 3 or weak bristles only	none (but distinct dorsal sp.)
Femoral spines	I: 0 – 1 prolateral	3 dorsal	3 dorsal	3 dorsal	δ I – II: 0 – 2, I – II: 0 (–1)	I – II: 1 dorsal
Tarsal trichobothria	2	BP (3 – 7)	BP (2 – 4)	BP (2 – 4)	1 – 2	none
Cymbium	short oval – long oval	unmodified	unmodified	unmodified	short oval – long oval	δ unknown
Tibial processes	long folded falciform + variable basal	long folded falciform + short basal	2 short latero-apical	3 short apical	furrow for conductor	
Patellar processes	none	none	patella strongly swollen	none	simple dorsoapical – none	
Origination of embolus	basal	basal	central	basal – central	basal – central	
Apex of conductor	variably modified	outstanding thin hook – spiral	variable	screwed	complicated screw in tibial furrow	
Tegular apophyses	1 – 2 laminae	none	inconspicuous	none	none	
Epigynal plate	$\pm$ indistinctly limited	$\pm$ indistinctly limited	$\pm$ indistinctly limited	$\pm$ indistinctly limited	variable, often indistinctly limited	caudal arch
Epigynal foveae	paired – unpaired central	unpaired transversal oval or seldom paired	small paired or unpaired, central anterior	paired or unpaired, variable position	very variable in size and position, paired or unpaired	incompletely paired
Vulval ducts	rather thick, double coil	complicated pattern of thin ducts, sometimes thick ducts	very simple	$\pm$ simple	complicated pattern of thin, coiled ducts – short rather thick ducts	short
Seminal receptacula	small central globular	2 (– 1) pairs, globular	large globular	large, $\pm$ oval	globular, variable in size	globular lateral
Special characters					δ chelic. strongly modified; vertical section of petiolus with narrow transversal group of tracheae	cephalic area very high; epigyne & vulva almost as in <i>Cybaeolus delfini</i> (Hahnidae)
Distribution	Palaearctic – W. Nearctic	Holarctic	W. Nearctic	S. Nearctic	Holarctic – N. Neotropical	S. Oriental

Thaidoidea

Megadictynidae: *Megadictyna*

Amaurobioidea

Amaurobiidae Matachiinae: *Lathyarcha*– Macrobuninae: *Anisacate*, *Notolathys*, *Opsaltella*,
Pseudauximus, *Retiro*– Altellopsinae: *Altellopsis*, *Neuquenina*– Metaltellinae: *Aebutinoides*, *Ciniflrella*, *Metaltella*Titanocidae: *Temecula*

Zodarioidea

Zodariidae s. lat.: *Arushina*, *Hoplolathys*Incertae sedis: *Aebutina*

As in the case of Hahniidae and Amaurobiidae, the range of Dictynidae covers the whole world. This can evidently be explained by the adaptation of Dictyninae to various ecological niches of the vegetation layers. It is a well-known fact that the range of most families of spiders with similar ecological distribution is universally independent of their taxonomic position (Araneidae, Theridiidae, Thomisidae, Salticidae, etc.). The other subfamilies of Dictynidae include mainly terricolous species, and their total range is also much more restricted.

Cicurininae

The Ecribellate members of this mainly Holarctic subfamily have generally been included in Agelenidae: Ageleninae, although their genital pattern is basically similar to that of Dictynidae, and thus also similar to Cybaeinae. Such placings can be explained by the pattern of spinnerets. On the other hand, the anterior spinnerets in Dictynidae auct. are also often widely spaced, in direct contrast to *Cybaeus* and related genera.

The relationship between Cicurininae and Cybaeinae is not finally cleared up, and perhaps they could be united in a single, monophyletic subfamily. As this does not seem feasible, I prefer to keep the monophyletic groups Cybaeinae and Cicurininae as separate taxa.

The Nearctic species of *Cicurina* (CHAMBERLIN & IVIE 1940), *Blabomma* (CHAMBERLIN & IVIE 1937), *Yorima* (ROTH 1956), *Lathys* and *Brommella* (CHAMBERLIN & GERTSCH 1958) have been preliminarily revised or at least fairly well figured, but the latter two Cribellate genera have never been listed together with the three Ecribellate genera.

Cicurina is closely related to the Cribellate genus *Brommella*. The resemblance in the details of the complicated genital organs of these genera is surprising, especially in view of the differences in size and linked characters of hair and spine pattern (cf. p. 321 and also p. 278).

Blabomma and *Yorima* constitute another group, and they may be derived from a basic type of the former group, while *Lathys*, probably accompanied by the Oriental genus *Atelolathys*, stands more isolated (Table 30).

The subfamilial name Cicurininae derives from an old subdivision of Agelenidae by F. O. PICKARD-CAMBRIDGE (1893).

There is a general trend towards reduction of anterior median eyes in Cicurininae. Thus the number of eyes cannot be used at all as a generic key character in this subfamily (see also CHAMBERLIN & IVIE 1940, GERTSCH 1946 a), and its application to this purpose is doubtful even at specific level, at least in the case of *Lathys heterophthalmus*.

Litisedinae

This new subfamily probably extends its range over the whole Pacific area, but only two species have been described so far, one from Japan, the other from Polynesia. Litisedinae seems to be the Dictynid equivalent of Desinae as far as ecological adaptation is concerned, and thus the external similarity of these two groups is noticeable. However, the Litisedine species are easily recognizable by their genital organs. When compared with their nearest Dictynid relatives, Cybaeinae, the exceptional structure of both chelicerae and spinnerets afford practical characteristics (cf. Tables 29 and 31).

Cybaeinae

The classical definition of Cybaeinae (BANKS 1892, SIMON 1897) emphasizes the presence of an unmodified pattern of spinnerets. The use of this overemphasized character has resulted in the lumping of several different lines of evolution in Amaurobioidea.

As Cybaeinae has always before been treated as an Agelenid subfamily, the genera transferred here to other groups are discussed on p. 342.

My Cybaeinae is restricted to a distinctly monophyletic group of Holarctic Dictynid genera

Table 31. Dictynidae: Litisedinae.

	<i>Litisedes</i>	<i>Swainsia</i>
Figure	275; O1 (1960, Fig. 10 – 15)	269 – 270
Size	medium	small
Colulus	large semicircular, hairy	very large semicircular, hairy
AS	long cylindrical, widely spaced	long cylindrical, widely spaced
MS	long and slender	long and slender
Apic./bas. segment of PS	2/3 – 1	> 1
Shape of abdomen	oval	long oval
Abdominal pattern	none	none
Shape of carapace	wide pear-shaped	pear-shaped
Fovea	short, very shallow	rather long, gradually sloping
Height of clypeus	< σ PM, < $\frac{1}{2}$ σ AL	= σ AM, < $\frac{1}{2}$ σ AL
Size of eyes	AL > AM = PL = PM	AL > AM = PL > PM
Shape of MOT	wide trapezoidal	wide slightly trapezoidal
Shape of chelicerae	long, groove very oblique	long, basally thick, distally strongly tapering, groove oblique
Cheliceral armature	6 – 7 subequal + 3 large	8 subequal + 3 large in oblique row
Labium	~ as long as wide, truncate	~ as long as wide, $\pm$ rounded
Shape of sternum	rounded heart-shaped	subcircular, wider than long
Apex of sternum	shortly truncate	rounded obtuse
Tib. & met. v. sp.	2 + 2 of moderate length	2 + 3 – 4 (all short, tibiae with a basal pair and 2 – 3 subapical – apical)
Femoral spines	1 + 1 – 2 dorsal	1 + 1 – 2 dorsal
Patellar and basodorsal tibial spines	long (cf. Hahniidae)	long
Tarsal trichobothria	short BP (5)	short and indistinct (2 – 4)
Metatarsal trichobothria	1 long apical + 1 – 2 short unnotched	3 short apical-subapical (< 1 $\frac{1}{2}$ σ mt) unnotched
Trochanterae		
Cymbium	with long apex	with long apex and basodors. projection
Tibial processes	dorsal lobe + narrow apic. process	dorsal lobe + large central process
Origination of embolus	subbasal	subbasal
Shape of embolus	thin semicircular	thin semicircular
Type of conductor	narrow oval, longitudinal	large longitudinal sclerite
Apex of conductor	double apex	long carina with acute apex
Epigynal foveae	semicircular anterior + large paired oblique depression	$\varnothing$ unknown
Epigynal plate	median septum	
Seminal receptacula	small central globular	
Distribution	E. Palearctic (Japan)	Australian (Polynesia)

grouped around the large and widely distributed genus *Cybaeus*. Their genital pattern is strikingly similar to that of Dictynidae, and it is difficult to understand why phylogenetic relationship between the classical Cybaeinae and Dictynidae has never been proposed by other authors. CHAMBERLIN & IVIE (1932, p. 6) did indeed notice the similarity of their genital organs, but they seem to have regarded it as convergence. PETRUNKEVITCH (1923) had emphasized the insignificance of genital characters in phylogenetic analysis, and all the later authors seem to have trusted his authority; this topic has never been seriously discussed, except by ARCHER (1948).

The three genera, *Cybaeina*, *Cybaeozyga*, and *Cybaeus*, constitute a compact group, while *Cybaeola* represents a deviating type (Table 32). It even has a spinneret pattern that does not conform to the classical definition of Cybaeinae.

Argyronetinae

A discussion of the results of rapid adaptive radiation in Amaurobioid spiders has been presented in connection with Desinae on p. 325.

The derivation of *Argyroneta* from Cybaeinae is undisputed, but the inclusion of this genus in Cybaeinae would cause unnecessarily great practical difficulties in the definition of these taxa. The subfamily Litisedinae represents an instance of later parallel adaptation with less emphasized adaptive characters.

The history of limitation of Argyronetidae has been summarized on p. 309, and it has been described in detail by ROTH (1967 b). A wide limitation of this family has, in fact, never been argued, but repeatedly listed in catalogues. I agree with ROTH (*op. cit.*) concerning the exclusion of other genera from this group, although my placing of Argyronetinae is different.

Table 32. Dictynidae: Cybaeinae.

	<i>Cybaeota</i>	<i>Cybaeina</i>	<i>Cybaeozygga</i>	<i>Cybaeus</i>	<i>Saltonia</i> ¹
Figure	CHAMBERLIN & IVIE (1937)	CHAMBERLIN & IVIE (1932)	CHAMBERLIN & IVIE (1937)	267, 272	CHAMBERLIN & IVIE (1942 b, f. 24 – 25)
Size	small – minute	small – medium	small	medium – large	small
Colulus	reduced to setae	reduced to setae	?	hairy transversal	very large
Pattern of spinnerets	wide BP	BP	BP	BP	wide BP
Abdominal pattern	simple BP	none	simple BP	BP – obscure	none
Shape of carapace	pear-shaped	wide pear-shaped	pear-shaped	pear-shaped	pear-shaped
Size of AM	< PM	< PM	minute	≤ PM	< PM
Shape of MOT	strongly trapezoidal	trapezoidal	strongly trapezoidal	trapezoidal	long subrectangular
Cheliceral teeth	4 + 3	4 & several denticles + 3	?	3 – 5 & denticles + 3	2 + 3
Labium	very wide	wide	wide	± as long as wide	very long
Apex of sternum	obtuse	long pointed	?	shortly pointed	shortly pointed
Tib. & met. v. sp.	5 + 3	4 – 5 + 3	3 + 3	2 – 4 + 3	2 + 3
Tarsal trichobothria	2 – 3	2 – 3	2 – 3	5 – 8	4 – 5
Cymbium	unmodified	unmodified	unmodified	unmodified	basally with a dorsal thickening
Tibial processes	apical lobe + 1 triangular	lateral lamina	narrow apical hook	lateral – apical lamina	insignificant
Patellar processes	none	apical lobe with small hooks	none	large apical boss with ctenidia	none
Origination of embolus	apical	basal	central	(apical –) subapical (– central)	subapical
Shape of embolus	short tapering spine	long and thin	semicircular, rather thin	thin semicircular	thin semicircular
Apex of conductor	caudally pointed, acute	caudally pointed, coiled	rounded	caudally pointed, variable	caudally pointed, acute
Tegular apophysis	small twisted	none	none	indistinct – none	none
Epigynal foveae	unpaired oval	indistinct caudal semicircular	♀ undescribed (ROTH in litt.)	variable (paired – unpaired)	♀ unknown
Vulval structure	simple	rather complicated, ducts coiled		rather simple	
Seminal receptacula	large globular	small globular		globular – oval (+ econd. rec.)	
Special characters	III – IV legs with reduced spinulation	♂ chelicerae long, their groove very oblique	cephalic area gibbous in profile	—	spines long
Distribution	Nearctic	W. Nearctic	NW. Nearctic	Holarctic	SW. Nearctic

¹ Since the manuscript was completed, the type material has been checked. The genus *Saltonia* must be transferred to Tricholathysinae, close to *Devade* (Table 33).

Table 33. Dictynidae: Tricholathysinae (continued on p. 357).

	<i>Hackmania</i>	<i>Altella</i>	<i>Argenna</i>	<i>Chaerea</i>	<i>Tricholathys</i>
Figure	273 – 274, 278	279 – 281, 283	52 & WIEHLE (1953)	–	282, 286; CHAMBERLIN & GERTSCH (1958)
Size	minute	minute	minute – small	small	small – medium
Cribellum – colulus	cr: small undivided	cr: small undivided	cr: small undivided	cr: small undivided	cr: undivided
Shape of spinnerets	± cylindrical	slender BP – all cylindr.	slender BP	slender BP	BP
Abdominal pattern	none	practically none	obscure simple BP	none	simple BP – none
Shape of carapace	wide pear-shaped	pear-shaped, cephalic area short	pear-shaped	long oval	pear-shaped
Fovea	absent	absent	absent	absent	short and shallow
Size of AM	< PM	≤ PM	subequal to PM	equal to PM	equal to PM
Shape of MOT	wide trapezoidal	long trapezoidal – trapez.	trapezoidal	wide trapezoidal	wide subrectangular
Cheliceral teeth	2 – 3 + 3	2 + 3	2 + 3	2 + 3	3 – 4 + 4 – 5
Maxillae	oval converging, ♂ with basal boss	distally enlarged – oval	long parallel, converging	long and curved, converging	long subparallel, ♂ with small boss
Labium	semicircular	as wide as long, rounded	wide, distally truncate	long, distally rounded	long, distally truncate
Shape of sternum	wide heart-shaped	subcircular	heart-shaped	heart-shaped	long heart-shaped
Apex of sternum	widely truncate	widely rounded	short, rounded	short, rounded	long, narrowly truncate
Metatarsal spinulation	none – weak bristles	♀: 1 – 2 v., ♂ I: 2 – 3 ventral hooks	III – IV: apical ring	III – IV: apical ring	III – IV: apical ring + II – IV: 1 – 2 lat. + ventr.
Tibial spinulation	none – weak bristles	♀ I: 1 – 3 ventral, ♂ III: 1 ventral	none	♀: none, ♂ IV: 1 strong ventral	III – IV: 1 – 2 v. + 1 – 2 lateral
Tib. & met. trichobothria	2 + 2	1 – 2 + 2	2 + 2 – 3	2 – 3 + 2 rather short	3 + 2 – 3 (rather short and indistinct)
Calamistral hairs	8 – 12	5 – 8	13 – 14	ca. 15	15 – 20
Cymbium	short oval	unmodified	unmodified	unmodified	unmodified
Apex of tibial lobe	largely modified thin lamella	rounded – obtuse	slightly notched	widely truncate	rounded – slightly notched
Origination of embolus	central	central	central	central	basal – subbasal
Type of embolus	thin semicircular	thin semicircular	thin semicircular	thin semicircular	thin, strongly coiled
Type of conductor	thick longitudinal lobe	small longitudinal fold	thick longitudinal lobe	curved and folded lamina	large folded semicircular
Apex of conductor	long and pointed or hammer-shaped	sagittate	curved and pointed	sagittate	spiral coil
Epigynal foveae	large central, with marginal small teeth	variable in size, central	variable in size, central, medially ± open	lateral, large oval	very large and shallow, central, margins spirally coiled
Vulval ducts	short and simple	short and rather simple	short and rather simple	long ± transversal	thick subcircular coils
Special characters	legs short and stout, ♂ I mt. & tib. ventrally with numerous short teeth in 4 irregular rows, ♂ I femora with warts	carapace ± flat	♂ chelicerae with numerous warts	♂ chelicerae with numerous warts	palpal femora ± thickened
Ecological distribution	terrestrial	terrestrial	terrestrial	terrestrial	terrestrial
Distribution	N. Holarctic	W. Palearctic	Holarctic	W. Mediterranean	W. Nearctic

Table 33. Dictynidae: Tricholathysinae (continued).

	<i>Arctella</i>	<i>Iviella</i>	<i>Argennina</i>	<i>Devade</i> ¹	<i>Mizaga</i>
Figure	285; HOLM (1945)	CHAMBERLIN & GERTSCH (1958, pl. 2: 6-9)	CHAMBERLIN & GERTSCH (1958, pl. 2: 10)	276, 284	271, 277
Size	small	small - minute	medium	medium - small	medium - small
Cribellum - colulus	cr: undivided	cr: undivided	cr: undivided	cr: undivided	co: hairy semicircular
Shape of spinnerets	BP	BP	BP	BP	BP (rather slender)
Abdominal pattern	obscure simple BP - none	none	none	obscure simple BP - none	none
Shape of carapace	long oval, ant. tapering	pear-shaped	pear-shaped	pear-shaped	long pear-shaped
Fovea	long and shallow	indistinct	indistinct	long and rather deep	long and shallow
Size of AM	subequal to PM	≤ PM	≤ PM	> PM	< PM
Shape of MOT	wide trapezoidal	wide trapezoidal	wide trapezoidal	quadrangular	wide trapezoidal
Cheliceral teeth	2 + 4 - 5	4 + 4 - 5	2 + 3	2 + 3	2 widely spaced + 3 strong
Maxillae	long subparallel	long converging	long subparallel	long subparallel, ♂ with boss	very long, distally with right angle
Labium	long, distally rounded	long, distally rounded	long	long, distally truncate	very long, distally truncate
Shape of sternum	long heart-shaped	long, heart-shaped	long, heart-shaped	heart-shaped	heart-shaped
Apex of sternum	long, pointed	shortly pointed	short, obtuse	short, rounded	rounded right angle
Metatarsal spinulation	I - IV: 1 - 2 ventral III - IV: apical ring	I - IV: apical pair + 1 unpaired	I - IV: 1 - 3 ventral	III - IV: 3 pairs ventral + several lateral & dorsal	I: 4 p. ventral, II - IV: 3 p. ventral (+ lat.)
Tibial spinulation	III - IV: 2 - 3 v. + lat.	1 - 2 ventral	II - IV: v. + prolateral	I - IV: 2 p. v. + several lateral and dorsal	I - IV: 1 - 3 p. v. + a few lateral
T. & met. trichobothria	3 + 3	2 - 3 + 2 - 3	2 - 3 + 2 - 3	3 - 4 + 3 - 4 (rather short)	6 + 6 - 7 (long)
Calamistral hairs	12 - 15	about 15	weakly curved setae	ca. 20	-
Cymbium	short oval	± unmodified	♂ unknown	apex very long, baso-dorsal fold	apex long
Apex of tibial lobe	rounded	acute		minute lamella	obtuse carina
Origination of embolus	subapical	basal		central	central
Type of embolus	thin strongly coiled	very long and thin, coiled		semicircular, rather thick	thin semicircular
Type of conductor	complicated basal sclerite	very long folded lamella		large triangular plate	narrow longitudinal plate
Apex of conductor	wide convex plate	curved with double apex		double hook	narrow rugose rod
Epigynal foveae	large central	rather small lateral	small central, closely spaced	large longitudinal oval	central oval
Vulval ducts	short and simple	strongly coiled	tapering double arch	short and simple	short and simple
Special characters	-	-	abdomen very narrow	distinct epigynal septum present	chelicerae very strong, converging
Ecological distribution	alpine terrestrial	terrestrial	terrestrial	terrestrial	intertidal
Distribution	N. Palearctic - NW. Nearctic	E. Nearctic	S. Nearctic	Mediterranean - C. Ethiopian	Mediterranean - C. Ethiopian

¹ For *Saltonia*, see p. 355.

Table 34. Dictynidae: Dictyninae

	<i>Archaeodictyna</i>	<i>Emblyna</i>	<i>Dictyna</i>	<i>Phantyna</i>	<i>Tivyna</i>
Figure	295, 299, 307, 317, 325, 333	290–291, 298, 304; CHAMBERLIN & GERTSCH (1958, pl. 27–47)	53, 66–67, 287–289, 292–294, 302, 306, 320–322; CHAMBERLIN & GERTSCH (1958, pl. 16–26)	338; CHAMBERLIN & GERTSCH (1958, pl. 13–15)	CHAMBERLIN & GERTSCH (1958, pl. 11)
Size	minute – small	small	small – minute	small	small
Cribellum	entire	entire	entire	entire	entire
Ant. spinnerets	short conical	short conical	short conical	short conical	short conical
Post. spinnerets	short cylindrical	short cylindrical	short cylindrical	short cylindrical	short cylindrical
Cheliceral teeth	0 – 1 + 3	0 – 1 + 3	0 – 1 + 3	0 + 3	1 + 3
♂ cheliceral modifications	± lengthened	central pit, basal carina	central pit; basal horns	oval median pit	narrow median pit
Chalk bodies	none	none	none	none	none
Labium	♀ wide, ♂ long	variable	variable	long	long
Shape of MOT	wide	wide – quadrangular	wide – quadrangular	wide	wide
Metatarsal spines	none	none	none	none	none
Tarsal trichob.	0	0 – 1	0	0	0
Metat. trichob.	1	2 – 3	1 (– 2?)	1	1 – 2
Cymbium	normal	normal	normal	normal	normal
Tibial processes	1 – 0 of variable site	1 basal – central	1 basal	1 – 3	numerous
Tibial ctenidia	0 – 2	2	1 – 4	1 – 2	0 – 1
Patella	normal	normal	normal	globular with processes	globular with processes
Origin. of embolus	basal-central	basal (– central)	basal – subapical	basal – central	basal
Apex of embolus	folded	strongly modified	thin	thin	thin
Apex of conductor	dorsally curved	usually gently curved	variable	small spiral	variable
Arch of conductor	none	variable size	strongly variable	usually present	long, folded
Central foveae	variable	central with narrow septum	variable	variable	long, oblique
Lateral foveae	lacking	caudolaterally sloping	variable in site	present	lacking
Vulval structure	large receptacula	complicated receptacula	V-type	double curve	U-type
Special characters	♂ carapace strongly raised	—	—	—	longitudinal central epigynal funnel
Distribution	Ethiopian – Palearctic – Oriental	Nearctic – N. Neotropical – N. Palearctic	Holarctic	S. Nearctic – N. Neotropical	S. Nearctic – N. Neotropical

The single Argyronetine species, *Argyroneta aquatica*, the well-known Palearctic water-spider, is the only species that has been adapted to continuous submerged life in inland waters. When captured from terrestrial habitats, it could be confused with some dark species of Gnaphosids, but a more detailed investigation easily reveals the absence of fovea on the carapace, well developed median spinnerets, and the dense hair covering. The site of the stigma is also exceptional in Palearctic spiders of this size class, although Anyphaenidae is sparsely represented also in this region.

Tricholathysinae

This mainly Cribellate subfamily has been adapted to terrestrial life, with the exception of the genus *Mizaga*, which is an inhabitant of the intertidal zone. Structurally the representatives of Tricholathysinae deviate from Dictynine spiders in the weak modification of the male palpal tibia, less reduced leg spinulation and tarsal trichobothria, as well as by the colour pattern which more closely resembles the basic pattern of Amaurobioidea than does the modified Dictynine pattern (Table 33).

The method of limitation of genera in this

(continued on pp. 360–361).

<i>Tahuantina</i>	<i>Mexittia</i>	<i>Mallos</i>	<i>Marilynia</i>	<i>Arangina</i>	<i>Shango</i>
326	300, 314	CHAMBERLIN & GERTSCH (1958, pl. 8–9)	310	328; R. MARPLES (1959, p. 350 Fig. 7811)	~
medium	medium	small	small	medium	small
entire short conical short cylindrical	entire – bipartite strongly conical short cylindrical	entire – bipartite short conical short cylindrical	entire short cylindrical long cylindrical	entire short conical short cylindrical	entire short cylindrical short cylindrical
?	2 + 3	2 – 3 + 3 – 4	0 + 2	1 + (serrate carina + 1)	?
lengthened	insignificant	variable	lateral boss, oval pit, long carina	long anterior horns	?
none long long	none long wide	lateral as long as wide wide	none as long as wide long	none as long as wide wide	none very long wide
none	none	none – weak apical ring	weak apical ring	apical ring	none
I – III: 0; IV: 1	0 1 – 2	0 – 2 indistinct 2 – 3	0 2	0 2 – 3	1 2
normal 1 strong	normal small apical	normal weak apical	normal long basal	normal central	♂ unknown
4 normal	0 normal	none normal	2 normal	2 normal	
subapical thin caudally pointed	subbasal thick wide lamellar	subbasal – subapic. thin moderately coiled	ventral subapical thick curved	basal very thin spirally coiled	
none	none	none	none	large	
♀ unknown	two pairs cf. above	large, variable in shape none	caudal transversal caudal	large central none	anterior unpaired central
	simple	spirally coiled	V-type	V-type	?
very dark	–	–	embolus circular	–	brown hairs on carapace
W. Neotropical	W. Nearctic – N. Neotropical	S. & C. Nearctic – N. Neotropical	W. Palearctic	Australian (New Zealand)	S. Ethiopian

group has differed greatly from that currently applied by almost all authors except CHAMBERLIN (1948) to my Dictyninae. The result has been the inclusion of numerous small genera in the group I call Tricholathysinae, but of only a single enormous genus, *Dictyna*, in Dictyninae, together with a few small ones, usually separated according to a single character (e.g., LOCKET & MILLIDGE 1951, WIEHLE 1953, CHAMBERLIN & GERTSCH 1958). An explanation will be found in the evaluation of different characters for generic criteria by most recent authors: genital characters have been reserved for species characters only, while more or less insignificant structural modifications in the spinulation of legs, cheliceral armature, eye pattern, etc.,

have been generally accepted as generic criteria in any group of spiders. Now, there is a general trend towards the reduction of spinulation, trichobothria, and even of cheliceral armature, in my Dictyninae, while characters derived from these structures are more variable and more easily observed in Tricholathysine spiders, because they have spines and tarsal trichobothria that can be modified. For my part, I prefer to use the same standards for limitation of genera throughout the family; hence the emphasis is laid on such characters as are equally present in both the subfamilies discussed here.

In practice it is rather a matter of opinion whether the well-known Tricholathysine genera

Table 34. Dictyninae:

	<i>Brigittea</i>	<i>Nigma</i>	<i>Ajmonia</i>	<i>Anaxibia</i>	<i>Dictynomorpha</i>
Figure	297, 301, 308 – 309, 311, 323 – 324, 340	312, 316, 329, 331	332	303, 327	–
Size	small	small	small – minute	minute – small	medium – small
Cribellum	bipartite	bipartite (– entire)	bipartite (– ♂ reduced)	reduced	large undivided
Ant. spinnerets	strongly conical	short conical	moderate conical	long cylindrical	moderate conical
Post. spinnerets	short cylindrical	short cylindrical	moderate cylindrical	very long cylindrical	moderate cylindrical
Cheliceral teeth	1 + 3	1 + 3 – 5	1 + 3	1 + 4	2 – 4 + 5 – 6
♂ cheliceral modifications	ventral boss + anterior teeth	anterobasal swelling	narrow central pit	none	bas. transv. fold – unmodified
Chalk bodies	none	lateral	long lateral	lateral	variable lateral
Labium	variable	variable	long	wide	as long as wide
Shape of MOT	wide to equal	wide	± quadrangular	wide	wide rectangular
Metatarsal spines	none	none	none	none	none
Tarsal trichob.	0	1 – 0	0	0	1 – 2 short
Metat. trichob.	1 – 2	1 – 2	2	1	4 – 5 short
Cymbium	normal	normal	caudal projection	with caudal modif.	caudal projection
Tibial processes	basal	apical dilatation	lat. & centr. lobes	variable short	lat. & centr. lobes
Tibial ctenidia	2	none	none	none	none
Patella	normal	unmodified (lat. proc.)	large dorsal process	dorsal horns	lateral-apical process
Origin. of embolus	central	central	central – subapical	subapical	central
Apex of embolus	folded	thick, with small hook	rather thick, simple	thick	strongly variable
Apex of conductor	caudally pointed, rugose	caudally pointed	thick with minute tooth	wide lamellar	caudally pointed
Arch of conductor	none	none	none	none	none
Central foveae	central, coiled	insignificant	small unpaired	in a caudal plate	small pits – insignificant
Lateral foveae	transversal, centr.	none	none	none	none
Vulval structure	spiral	spiral	? (complicated)	simple	simple spiral
Special characters	–	green – pink	♂ maxillae long	–	green – yellowish abdomen; embolus Λ-shaped
Distribution	Oriental – Palearctic	Palaearctic – Oriental	Oriental – SE & SW. Palearctic	Oriental – Ethiopian	Oriental – SE. Palearctic

should be lumped together to constitute a few larger ones, or whether some of the Dictynine genera should be split up, so as to correspond to the limitation of, e.g., *Altella* and *Argenna*. For argumentation of the alternative that has been chosen here, see Dictyninae.

The bulk of the Tricholathysine species are restricted to the Holarctic area, where they are found as far north as the subarctic region, while representatives of *Devade* and *Mizaga* are also found in the Ethiopian region. These two genera differ in several characters, and, together with *Saltonia*, they could be separated to form a tribe of their own.

The remaining genera can be grouped in two series of closely related genera, viz. *Argenna* – *Altella* – *Hackmania* – *Chaerea* and *Arctella* – *Iviella* – *Tricholathys* – *Argennina*. The structure

of the male genital organs is homogeneous in the former series, while there are divergent trends in the female genital organs. In the latter series, the corresponding trends are exactly opposite when the sexes are compared.

Dictyninae

It is in this, the largest subfamily of Dictynidae and even of the whole Amaurobioidea that the limitation of genera has caused the most trouble. By some standards, all the 22 genera accepted could be united, and then a worldwide genus comparable to *Theridion* as limited by LEVI & LEVI (1962) and LEVI (1963) would be the result. Most of the exotic species of Dictyninae have probably not yet been described,

Dictyninae (continued).

<i>Mashimo</i>	<i>Callevophthalmus</i>	<i>Sudesna</i>	<i>Rhion</i>	<i>Banaidja</i>	<i>Thallumetus</i>	† <i>Eolathys</i>
337	296, 319	305, 318	313	334, 341	315; CHAMBERLIN & GERTSCH (1958)	PETRUNKEVITCH (1950)
small	small	small	minute	small	small	small
entire	entire	entire	entire	reduced	entire	entire
short cylindrical long cylindrical	short conical short cylindrical	strongly conical short cylindrical	long cylindrical long cylindrical	short conical long cylindrical	short conical short cylindrical	short conical short cylindrical
1 + 4 strong ?	2 + 3 none	2 + 3 narrowed	1 + 3 none	1 + 2 long anterior carina	0 + 3 none	0 + 2 - 4 ?
pale continuous bands	none	continuous white sides	very pale	none	none - lateral	?
long very wide	very wide wide	long wide	very wide AM absent	long long	as long as wide wide	long long
none 1 short 2	apical ring 0 1	none 2 - 3 1 - 3	none 0 1	none 0 1	none 0 1 - 2	IV: apical ? ?
♂ unknown	normal none none normal	normal none 1 normal	normal none 2 normal	elongated small central 2 normal	with caudal modif. very complicated none modified	♂ unknown
	central thin	central thick	central thick	basal thick	subapical thin	
	caudally pointed	screwed	caudally pointed	quite small	thickened - lamellar	
	none	none	none	none	none	
in a caudal plate anterior pointed	anterolateral	anterior, coiled	anterior	small central	very variable	small
	none	none	none	caudolaterally sloping	none	none
simple	lateral oblique spiral	spiral	spiral	bent spiral	variable	
-	PM sometimes reduced	whitish	-	abdomen narrow	abdomen many- coloured	femoral spines?
S. Ethiopian	Australian	E. Palearctic - Oriental	S. Oriental	Australian (Samoa)	Neotropical	† Baltic amber

but I personally do not believe that the further increase of species could fundamentally alter the present limitation of genera. Cf. also CHAMBERLIN & GERTSCH (1958).

A different choice has been made for the following reasons. Firstly, the genera accepted here certainly seem to represent monophyletic and clearly defined groups, although one cannot always be sure that juvenile specimens can be placed in the correct genus, and there may also be some difficulty concerning the females of a few species. Secondly, some generally accepted genera are usually limited according to some practical, but phylogenetically insignificant character, e.g., *Thallumetus*, *Rhion*, and *Mallos*; thus greatest stability is secured by using consistent standards in limiting the rest of Dictyninae rather than by uniting all of them. Thirdly, in most cases there are no problematic inter-

mediate species, although the placing of some species groups in the keys is sometimes difficult, e.g., *personata* group of *Emblyna* (cf. CHAMBERLIN & GERTSCH 1958).

No attempt has been made to describe all the new genera which could be established for the species in which at present only the female is known.

Table 34 lists the most important combinations of characters in the Dictynine genera, but some points arising from the present revisional study are worth mentioning here.

When *Dictyna* is defined as by CHAMBERLIN & GERTSCH (1958) in their excellent monography of the Nearctic Dictynids, the creation of several Palearctic and exotic genera is inevitable. The presence of a bipartite cribellum as such leads to the stabilization of two additional genera, *Ajmonia* and *Brigittea*. The structure of the

Table 35. Hahniidae: subfamilies.

	Cryphoeicinae	Hahniinae	Cybaeolinae
Size	small – medium	minute – medium	minute – small (– medium)
Colulus	distinctly unpaired	paired	± reduced
Pattern of spinnerets	BP – wide BP	one transversal row – BP	wide BP
Position of tracheal stigma	close to spinnerets (ca. 0.05)	0.15 – 0.75	0.10 – 0.25
Abdominal pattern	simple BP – none	simple PB – none	<i>Dictyna</i> type
Fovea	longitudinal	indistinct – longitudinal	indistinct
Eye pattern	2 rows, AM always smallest	2 rows, AM usually small	2 rows, all eyes ± subequal
Basal maxillar boss	none	distinct – none	♂ distinct, ♀ indistinct
Apex of sternum	usually ± pointed	usually ± truncate	truncate
Leg spinulation	BP of Amaurobioidea – mt & tib. I with rows of ventral spines	usually sparse, except 1 dorsal tibial and 1 dorsal patellar	BP of Amaurobioidea
Tarsal trichobotria	BP, often 2 – 3 only	1 – 2, seldom 3 – 4	indistinct
Cymbial modifications	shape variable, no lat. furrow	lateral furrow	lateral furrow
Paupal tibial processes	1 – 3 lateroapical processes, lateral excavation and basal process	usually 1 thin curved apical spine	1 large branched
Patellar processes	none – apical lobe	usually 1 basal hook	1 basal hook
Embolus	thin circular – short spine	thin ± circular	thin circular
Primary conductor	small – very large	absent	absent
Median apophysis	present – absent	usually totally reduced	totally reduced
Epigynal plate	usually small caudal	± indistinctly limited	caudal unpaired
Vulval structure	variably coiled	usually strongly coiled	moderately coiled
Distribution	Holarctic	World-wide	S. Neotropical

cribellum is by no means an absolute generic character in Dictyninae, as both entire and bipartite forms are found within *Mallos* and *Nigma*, but the other characters of the above genera refer to phylogenetically compact groupings.

The limitation of the genus *Archaeodictyna* is radically widened here and the shape of the male carapace cannot be used at all in defining this large and widely distributed genus, in which the structure of male and female genitalia is quite useful.

The genus *Nigma* poses a difficult nomenclatory problem (cf. p. 238). In my opinion, none of the invalid names used for this genus is outstanding, and thus none can be proposed for stabilization. CHAMBERLIN & GERTSCH (1958) used the name *Heterodictyna*.

The reciprocal phylogenetic relations of all the 22 genera cannot be finally decided yet, but their placing in Table 34 gives an approximate view of the supposed affinities.

The series *Archaeodictyna* – *Emblyna* – *Dictyna* – *Phantyna* – *Tivyna*, *Tahuantina* – *Mexillia* – *Mallos* – *Marilynia*, and *Nigma* – *Ajmonia* – *Sudesna* – *Brigittea* – *Callevophthalmus* – *Mashimo* – *Anaxibia* – *Rhion* – *Banaidja* have been regarded as representing the most distinct phylogenetic groups which might be called tribes. The position of *Arangina* and

Shango is puzzling. *Arangina* is a rare case in having well developed spines on the legs, while weaker ones are also present in some other genera, e.g., *Marilynia*, *Mallos*, and *Callevophthalmus*.

The fossil genus *Eolathys* has been tentatively included here, but I have not personally investigated its material, and its affinities to other genera remain obscure.

Hahniidae

The modification of the pattern of spinnerets to constitute a single transversal row, combined with the more or less advanced position of the tracheal stigma, has been a generally accepted key-combination of characters for Hahniidae since the establishment of this family by BERTKAU (1878). PETRUNKEVITCH (1933) observed the reduction in the number of cardiac ostia, and he removed this family to the branch Quadrostiatae. Then it was placed far from Agelenidae, although Hahniinae has often been listed as a subfamily of Agelenidae since SIMON (1897).

The analysis carried out by myself reveals that each of the characters mentioned above may undergo considerable variation within the limits of a single Hahniid genus. For example, the pattern of spinnerets of *Muizenbergia crozelensis*

Table. 36. Hahniidae: Cryphoecinae.

	<i>Tuberta</i>	<i>Cryphoecca</i>	<i>Dirksia</i>	<i>Calymmaria</i>
Figure	347, 349, 354 – 355	54, 351 – 352	344, 346	343, 345
Size	small – medium	small – medium	small – medium	medium – small
Colulus	transv. plate with 2 – 4 setae	transv. plate with 2 – 6 setae	transv. – semicirc. hairy plate	transv. – semicirc. hairy plate
Anterior spinnerets	cylindrical, widely spaced	thick cylindrical, $\pm$ closely spaced	cylindr. – subconical	distinctly conical, closely spaced
Apic./dist. segment of PS	0.5 – 0.75	0.25 – 0.75	0.5	0.5 – 1
Abdominal pattern	simple BP – none	simple BP – narrow light band	very distinct light BP	distinct light BP
Shape of carapace	wide pear-shaped	long pear-shaped	pear-shaped	pear-shaped (ceph. area narrow)
Pattern of carapace	none	obscure bands	wide central + narrow lat. bands	distinct dark bands
Fovea	rather short and deep	long and deep	long and deep	wide and deep, rather long
Size of AM	< PM	< PM	< PM	< PM
Shape of MOT	long trapezoidal	variable trapezoidal	slightly trapezoidal	long rectangular
Cheliceral teeth	2 – 6 + 3	3 – 5 + 2 – 3	4 + 2 – 3	4 – 8 + 3
Labium	wide	very wide – wide	wide – very wide	as long as wide
Apex of sternum	long but rounded	long truncate	long, truncate – pointed	pointed
Pattern of sternum	none	dark margin	dark margin	dark margin – none
Length of metat./carapace	0.4 – 0.7	0.4 – 0.6	0.6 – 0.9	1.6 – 2.4
Tib. & met. v. sp.	I – II: 3 – 6 + 3, III – IV: 2 – 3 + 3	I – II: 4 + 3, III – IV: 2 – 3 + 3	I – II: 5 – 7 + 3, III – IV: 3 + 3	I – IV: 3 + 3
Prolat. apic. femoral sp.	2 long but weak bristles	1 strong curved spine	2 – 3 strong in a dense row	1 normal spine (subcentral)
Tarsal spines	absent	absent	absent	present
Tarsal trichobothria	BP (3)	BP (2 – 3)	BP (3)	BP (5 – 9)
Leg colouration	unicolorous	distinctly annulated	annulated unicolorous	distinctly annulated
Cymbium	small flattened, apex long curved	$\pm$ unmodified	apex $\pm$ shortened	semiglobular + long and thin apex
Tibial modifications	small apical lobe + long central process	3 small apical lobes, lateral excavation and basal process	2 apical laminae, lateral excavation and basal process	2 apical laminae, subbasal excavation and basal process
Patellar modifications	none	none	none	apical lobe
Origination of embolus	basal – central	basal	subbasal – subapical	subapical
Shape of embolus	extremely long and thin, coiled	semicircular, rather thin	semicircular – short folded lamina	apex of variable length, base fused to conductor and tegulum
Size of primary conductor	extremely large	normal	small	rather large
Shape of conductor	folded lamina with coiled apex	folded lamina with acute apex	complicated lamina	longitud. sclerite with complic. apex
Median apophysis	totally reduced	narrow, distally tapering	totally reduced	totally reduced
Tegular apophysis	insignificant carina	2 central carinae	subapical carina	none (subtegular ectal carina)
Epigynal foveae	small unpaired subcaudal	insignificant	variable	narrow longit. furrow + anterior depression
Epigynal plate	insignificant	variable longitudinal septum	caudal $\pm$ triangular	caudal triangular
Vulval ducts	strongly coiled $\pm$ asymmetrical	thick with double coil	thick simple	simple and short
Seminal receptacula	small transversely oval	large oval	large reniform – oval	large globular
Special characters	–	–	δ palpal femora with a very distinct row of ventral bristles	abdomen long oval
Distribution	Palaearctic (Europe)	Holarctic	W. Nearctic & W. Mediterranean	W. – SW. Nearctic

¹ The position of *Ethobuella* was confirmed through examination of the type material after completion of the manuscript.

Table 37. Hahniidae: Hahniinae

	<i>Muizenbergia</i>	<i>Hahnia</i>	<i>Iberina</i>
Figure	55, 356, 360	357 – 359, 361 – 362	365, 369; HARM (1966, Fig. 17 – 35)
Size	medium – small	small – minute	minute
Colulus	paired hairy plate	paired plate – reduced	strongly reduced
Pattern of spinnerets	wide BP – curved row	curved – straight row	± straight row
Relat. length of spinnerets	bPS ≥ AS > MS	bPS ≥ AS > MS	bPS ≥ AS > MS
Apic./bas. segment of PS	0.5 – 1 ½	0.5 – 1	0.5 – 1
Position of tracheal stigma	0.3 – 0.6	0.2 – 0.33	0.25 – 0.4
Abdominal pattern	distinct simple BP – none ±	obscure light stripes	obscure – none
Shape of carapace	long – BP pear-shaped	pear-shaped	pear-shaped
Pattern of carapace	none – obscure bands	indistinct – none	none
Fovea	long and shallow	dark line	dark line – none
♂ carap.-abd. strid. organ	absent	absent	absent
Cheliceral teeth	3 – 6 + 3	3 – 4 + 2	3 + 2
Size of AM	≤ PM	< PM	< PM (– all eyes absent)
Shape of MOT	wide trapezoidal – subquadr.	wide trapezoidal – long	wide trapezoidal
Maxillae	long subparallel – oval	oval converging	rounded pentagonal
Basal maxillar boss	low but distinct	indistinct	indistinct
Labium	wide truncate – notched	wide truncate	very short and wide
Apex of sternum	± pointed	widely – narrowly truncate	widely truncate
Length of pat. & bas. tib. sp.	shorter than other spines	0.75 – 2.0 tib.	1.5 – 2.0 tib.
Femoral spines	2 dorsal	1 dorsal	none
Tib. & met. sp.	2 – 3 + 2 – 3 v. + lat. & dors.	2 + 2 to 0 + 0 v. + a few	0 + 1 to 0 + 0 v.
Tarsal spines	present – absent	absent	absent
Tarsal trichobothria	BP (3 – 4)	2 (long & short)	2 (long and short)
Position of metat. trichob.	subapical (2)	subapical – central (2)	central – subapical (2)
Colouration of legs	annulated – unicolorous	unicolorous	unicolorous – apices pale
Shape of cymbium	BP + basolateral furrow	distally rounded + basal furrow	distally rounded + lateral furrow
Shape of palpal tibia	short subcylindrical	short subcylindrical	short subcylindrical
Tibial processes	apical ± semicircular	apical ± semicircular	apical ± semicircular
Patellar process	hooked basal + hairy boss	hooked basal	hooked basal
Embolus	circular	circular	circular
Median apophysis	present – reduced	present	absent
Epigynal foveae	absent	oblique central – indistinct	absent
Vulval ducts	double coils – complicated	several coils	very complicated thin
Seminal receptacula	anterior globular + lateral	globular (1 – 2 pairs)	very large oval (+ small globular)
Special characters	–	ventral tegular margin often with a row of rigid setae	–
Distribution	Ethiopian – Oriental – Crozet Island – Malagasy	Holarctic – Neotropical	Palaearctic

represents the classical Hahnid type, while the spinnerets of *M. schubotzi* do not significantly deviate from those of *Cryphoea*.

Comparison of additional characters, such as the genital organs, colour pattern of the abdomen, maxillae, etc., shows that the limitation of Hahniidae must be widened. Here this family comprises the subfamilies Hahniinae, Cryphoeinae, and Cybaeolinae (Table 35), but further division of Hahniinae might be justified as well.

Cryphoeinae

In general appearance and habits, *Cryphoea* and *Tuberta* are rather similar to each other

and also to *Muizenbergia* of Hahniinae. Thus it is not surprising that some of their species were originally described under the generic name *Hahnia*; since THORELL (1870a) they have always been listed in Agelenidae: Ageleninae, but SIMON (1897) separated the group Cryphoeinae, approximately corresponding to the tribes of the current taxonomic hierarchy.

Evolution of the genital organs has led to bizarre structures in *Tuberta*, but the basic pattern of Hahniidae can be traced in both sexes. For the strikingly similar basic pattern of Toxopidae, see HICKMAN (1940).

Probably all the ancestors of Hahniidae had

(continued on pp. 366 – 367).

<i>Neoaviola</i>	<i>Scotospilus</i>	<i>Alistra</i>	<i>Unzickeria</i>
364; HICKMAN (1948)	371, 374; HICKMAN (1948)	363, 367 – 368	GERTSCH (1934, Fig. 5 – 8, 22 – 23, 27 – 28)
minute – small	small	minute – small	minute – small
strongly reduced weakly curved row	strongly reduced wide BP – strongly curved row	strongly reduced ± straight row	strongly reduced straight row
AS ≥ bPS > MS ≥ 1	bPS ≥ AS ≥ MS < 0.5	bPS ≥ AS > MS 0.5 – 0.75 (PS usually very long)	AS > bPS > MS 0.5 – 1
0.25 – 0.3 light stripes	0.3 – 0.65 distinct BP – modified – none	0.15 – 0.3 light stripes	0.20 – 0.35 wide light stripes
short – BP pearshaped none none absent 3 + 2 ≤ PM	short pearshaped none – dark bands none absent 1 + 2 < PM	BP – short pear-shaped indistinct – none none absent 2 + 2 subequal to PM – puncti- form	pear-shaped dark marginal bands – none dark line – true furrow absent 2 – 3 + 2 PM – minute
trapezoidal – subquadrang. short oval converging indistinct very short and wide widely truncate	wide trapezoidal short oval converging ± caudally projected wide truncate ± shortly pointed	quite variable variable converging low but ± distinct rounded triangular widely – narrowly truncate	variable trapezoidal subrectangular parallel distinct wide – as long as wide narrowly truncate
1.5 – 2 ½ Ø tibia none 0 + 1 + tib.: dors. & lat. absent 2 (long & short) central – subapical (2) unicolorous – apices pale	1.5 Ø tibia – reduced none absent absent 2 (long & short) subapical (2) unicolorous	2.5 – 4.5 Ø tibia none 1 – 2 + 1 v. + a few – none absent 1 – 2 (long and short/–) subapical – central (2) annulated – unicolorous	2 – 3 Ø tibia I – IV: dorsal 0 – 2 + 0 – 2 v. + dors. & lat. absent ? ? annulated – spotted
± unmodified	distally rounded & basolateral furrow	narrow with long apex	apex long, 2 strong ectal setae
short subcylindrical distally thin, bas. curved	short subcylindrical distally tapering + thick lobe	long cylindrical small apical carina	long cylindrical ± straight, directed forwards
basal thorn	thick basal with several hooks	blunt basal tooth	basal hook – teeth
semicircular absent	circular absent	rather thick, semicircular absent	circular absent
absent double coils small globular	absent double coils small widely spaced	absent very simple small widely spaced	anterior paired small thin coils 2 pairs
...	...	legs often long and thin	embolus with pars pendula, sternum with pattern
Australian	Australian – Oriental	Oriental – Australian – E. Palearctic	N. Neotropical

a median apophysis, while it has been independently reduced in most lines of the Hahniid evolution. In Cryphoecinae, it is totally reduced in *Tuberta*, and quite small and almost concealed under the conductor in *Cryphoea*.

The primary conductor is well-developed in all Cryphoecine genera, while it is practically non-existent in Hahniinae and Cybaeolinae. It is especially large in *Tuberta*.

Another group of closely related Cryphoecine genera consists of *Calymmaria*, *Ethobuella*, and *Dirksia*. The latter genus has previously been included as a subgenus in *Ethobuella*. Up till now, only Nearctic species of these genera

have been known, but the Palearctic species *Cryphoea pyrenaea* seems to be a close relative of *Dirksia cinctipes*. The male genital organs of these genera are characterized by a large tegulum, while the bulbal organs are small and concentrated to the apical part. The female genital organs resemble those of *Cryphoea*. *Calymmaria* has lengthened spinnerets, in this respect resembling the true Agelenids.

Cryphoecinae is the least specialized group of Hahniidae, and therefore the derivation of the whole family is most easily clarified by phylogenetic analysis of the five above-mentioned genera.

Table 37. Hahniidae:

	<i>Intihuatana</i>	<i>Amaloxenops</i>	<i>Neohahnia</i>
Figure	372 – 373	SCHIAPELLI <i>et al.</i> (1958)	366, 370
Size	minute	minute	minute – small
Colulus	strongly reduced	strongly reduced	strongly reduced
Pattern of spinnerets	straight row	straight row	straight row
Relat. length of spinnerets	bPS > AS > MS	AS ≥ bPS > MS	bPS = AS ≥ MS
Apic./bas. segment of PS	ca. 0.5	0.75 – 1.75	1 – 1.5
Position of tracheal stigma	0.25 – 0.45	0.2 – 0.3	0.15 – 0.5
Abdominal pattern	narrow light stripes	light stripes	light stripes
Shape of carapace	pear-shaped	long pear-shaped	wide oval – pear-shaped
Pattern of carapace	none	none	none
Fovea	none	none	dark line
♂ carap.-abd. strid. organ	absent	absent	absent
Cheliceral teeth	2 + 2 – 3	3 + 2	2 + 1
Size of AM	minute	absent – minute	minute – subequal to PM
Shape of MOT	± triangular	strongly trapezoidal	trapezoidal triangular
Maxillae	long converging	rounded pentagonal	very wide, strongly converging
Basal maxillar boss	indistinct	indistinct	indistinct
Labium	very wide	wide	very short and wide
Apex of sternum	widely truncate	widely truncate	widely truncate
Length of pat. & bas. tib. sp. (O of tibia)	reduced to hairs	?	2.5 – 4
Femoral spines	none	?	none
Tib. & met. sp.	none	? (present)	none
Tarsal spines	none	none	none
Tarsal trichobothria	probably none – 2	present (? BP)	BP (2)
Position of metat. trichob.	?	?	subcentral – central (2)
Colouration of legs	unicolorous	unicolorous	unicolorous
Shape of cymbium	distally rounded + basal furrow	basal furrow	distally rounded + basal furrow
Shape of palpal tibia	short trapezoidal	very short	short
Tibial processes	bifurcate lamina	short curved	apical ± thin semicircular
Patellar process	central wide tooth	? none	basal with 1 – 3 hooks
Embolus	circular	circular	circular
Median apophysis	absent	absent	absent
Epigynal foveae	small central pits	indistinct central	paired anterior «pockets»
Vulval ducts	thin with double coil	thin with double coil	almost globular
Seminal receptacula	small lateral	elongate central	small central
Special characters	anterior eye row very strongly procurved	AL exceptionally close to each other	–
Distribution	S. Neotropical	Neotropical	Neotropical

The central problem of the phylogeny of Hahniidae concerns the supposed homology of the median apophysis of the whole superfamily Amaurobioidea. The Hahniid species are generally small as are most of the Dictynid ones, and the exceptional colour pattern of Dictyninae is represented in Hahniidae by the colouration type of Cybaeolinae. However, the median apophysis is lacking in all known Dictynid species, even in relatively large species of Cybaeinae and Cicurinae. If the median apophysis has not been secondarily reduced during the evolution of Dictynidae, the derivation of

Hahniidae from a common ancestral stock with them is not possible.

Another possibility lies in the derivation of Hahniidae from an ancestral Amaurobid group. However, Hahniidae has a world-wide distribution and is thus certainly very old. Therefore it is further possible that it represents a different lineage which was quite early separated from the ancestral Amaurobioidean stock.

Hahniinae

The mutual relationships of the Hahnine

Hahniinae (continued).

<i>Hahnistea</i>	<i>Neoantistea</i>	<i>Antistea</i>	† <i>Eohahnia</i>
CHAMBERLIN & IVIE (1942 b)	375 & GERTSCH (1946 b)	377 – 378	PETRUNKOVITCH (1958)
minute	small	small – medium	minute
strongly reduced straight row	totally reduced straight row	strongly reduced curved row	?
bPS > AS > MS	AS > bPS > MS	bPS > AS > MS	? straight row
ca. 0.5	1 – 1.5	ca. 0.75	bPS > AS > MS
0.5	0.6 – 0.75	0.5 – 0.6	ca. 0.25
light stripes	central band of light > :s	obscure light stripes	?
long oval	wide pear-shaped	wide pear-shaped	wide pear-shaped
none	none (strongly glistening)	none	?
low depression	± rounded pit	long, caudally indistinct	? none
?	present	present	?
1 + 2	1 – 3 + 2 – 3	3 + 2	?
< PM	> PM	≥ PM	≥ PM (anterior eyes contiguous)
trapezoidal	quadrangular	quadrangular	anter. wide trapezium
rounded pentagonal	rounded subrectangular	rounded pentagonal	?
indistinct	large and protruding	large rounded	?
wide	± semicircular	wide semicircular	?
truncate	widely truncate	narrowly truncate	?
± reduced	1 – 2	similar to other spines	?
none	I: 1 prolateral	I: 1 dorsal & 1 prolateral	?
none	o – 1 + 1 – 2 v. + dors. & lat.	o – 1 + o – 1 v. + dors. & lat.	?
none	IV: often present	none	?
1	BP (3 – 4)	BP (3)	?
subapical – central (2)	subapical – subbasal (4)	subapical – central (2)	?
unicolorous	annulated	unicolorous	?
♂ unknown	flattened	long lateral furrow	♂ unknown
	very short trapezoidal lateral ± straight	subglobular	
	simple hook	strong, caudally projected	
	circular	subapical simple tooth	
	absent	very long (1 ½ – 2 coils)	
unpaired anterior	unpaired anterior-paired	large anterior	genitalia unknown
rather thick, double coils	very thick, often asymmetr.	three coils, asymmetrical	
central	large globular	small globular	
legs long	maxillae with lateroapical warts, ♂ femora with ventral warts	basal part of embolus covered with well developed pars pendula; palpal patella globular; palpal femur with long process	–
SW. Nearctic	Nearctic – E. Palearctic	Holarctic	† Baltic amber

genera remain partly obscure, and it is not quite certain whether the characteristic pattern of spinnerets was developed only once during the evolution of Hahniinae.

The armature of the male palpal tibia and patella is exceptionally constant in this subfamily, and the same basic pattern is also found in Cybaeolinae. Even the shape of the tibial and patellar apophyses seems to have considerable taxonomic value in Hahniinae, although the possibility of parallelism cannot be excluded. The genera *Muizenbergia* and *Hahnia* are cer-

tainly among the most primitive, because all their species have a distinct, spoon-shaped median apophysis, except that in an Oriental species of *Muizenbergia*, *M. oreophila*, there is only a scarcely visible rudiment of a median apophysis. In all other species of Hahniinae examined by myself, this structure has been completely reduced, but HARM (1966) figured a typical Hahnine median apophysis of *Hahnia picta*, placed by myself to the vicinity of *Antistea*. Probably the reduction has occurred in several different lineages.

The functional conductor of Hahniinae consists of a more or less well-developed groove in the cymbial margin, while the conductor proper is totally reduced. It is possible that this is the result of a general trend, although it is difficult to prove whether this modification has occurred in one or more different lineages, as no fossil evidence is available.

The female genitalia afford less practical patterns for phylogenetic analysis, although several details have notable relative value.

There are three groups of Hahniinae, which could be separated as tribes, at least, but the uncertain position of many genera has forced me to choose the alternative of lumping in the final classification of Hahniinae in this paper.

As stated above, the large genera *Muizenbergia* and *Hahnia* constitute a natural group, and *Iberina*, which has been radically relimited here, is most probably a derivative of this group. *Intihuatana*, *Amaloxenops* as well as several Neotropical and Oriental species with uncertain generic affiliation (*Hahnia heterophthalma*, *H. maxima*, and perhaps even *H. michaelsoni*), may belong to the vicinity of this group.

Neoantistea, *Neohahnia* (as provisionally defined and limited here with *Hahnia ernesti* as the typical species), and *Hahnistea* constitute the second group, while the well-known genus *Antistea* is probably a deviating member of this group. In the three first mentioned genera, the female genital organs closely resemble each other, and thus the placing of species where females only are known seems to be possible.

Alistra and *Unzickeria* seem to be closely related and obviously worthy of a different tribe, at least. They are characterized by very long spinnerets, abundance and length of leg spines and especially by the simplicity of the genital organs. Two other Australian genera, *Scotospilus* and *Neoaviola*, are undoubtedly related to each other, but they might also belong to the vicinity of *Alistra*. This group also shows affinities with Hahniini. The variation in size of the anterior median eyes is especially great in *Alistra*, and this character is here considered to be quite inappropriate as a sole generic character of Hahnids. Therefore «*Bigois*» is a mere assemblage of Hahnid species from different groups which have the anterior median eyes reduced in size, while the genotype belongs to *Alistra*.

The only fossil species of Hahnids, *Eohahnia succini*, has not been sufficiently characterized to be exactly placed.

Cybaeolinae

Representatives of this new subfamily resemble Dictynine spiders in colouration, size, and structure of spinnerets. Thus it is not surprising that one species has been described as a *Dictyna*. ROTH (1967 a) revised the genus *Mevianes*, and suggested a probable synonymy of this genus with *Cybaeolus*. In spite of this, these genera were listed by him in different subfamilies. He also described the new genus *Lizarba*, but placed all these genera in Agelenidae.

The structure of the genital organs in both sexes of the Cybaeoline spiders is surprisingly similar to that of Hahniinae (cf. ROTH 1967 a). However, there is no distinct functional conductor, but the tegulum is disc-shaped and surrounded by a circular embolus.

The genus *Austrohahnia* seems to belong here, but the original description is poor, and its relation to *Cybaeolus* and *Lizarba* remains obscure.

All the material of this group available in museums has been collected in the southernmost parts of the Neotropical region, and therefore the species are not well known.

Genera incertae sedis

Unfortunately some of the Amaurobioidean genera cannot be placed to any of the families accepted. They may, however, represent exceptional branches of some of these families. Besides, the uncertain placing of *Eocryphoea* and *Tandil* is partly due to the fact that no material of them has been available.

Callevopsis

Only females and males of penultimate instar are known of this Chilean genus. Its abdominal pattern is exceptional among Amaurobioidea, but it might be derived from the pattern of *Porteria* and *Corasoides*. At first sight, it also resembles the pattern of some Dictynine spiders. The fovea and spine pattern of the legs are quite exceptional (cf. Table 39), while the epigyne could well fit within the range of variation in Amaurobiidae: Macrobulinae.

Eocryphoea

PETRUNKOVITCH (1958) listed three species of this fossil genus. The pattern of spinnerets as well as that of the male genital organs refer to

Table 38. Hahniidae: Cybaeolinae. — For *Lizarba*, see p. 244 and ROTH (1967 a).

	<i>Cybaeolus</i>	<i>Austrohahnia</i>
Figure	348, 350, 353	MELLO-LEITÃO (1942)
Size	small — minute	small (—medium)
Colulus	reduced to setae	?
Pattern of spinnerets	wide BP	?
Anterior spinnerets	weakly conical	?
Posterior spinnerets	slender, apical segment short	?
Tracheal stigma	0.10 — 0.20	ca. 0.25
Abdominal pattern	reddish central folium, surrounded by whitish area, margins dark (<i>Dictyna</i> type)	dark brown <i>Dictyna</i> type
Shape of carapace	pear-shaped	pear-shaped, cephalic area high
Pattern of carapace	narrow black margins	indistinct
Fovea	indistinct	?
Cheliceral teeth	3 + 2	1 + 0
Size of AM	≤ PM	subequal to PM
Shape of MOT	trapezoidal	trapezoidal
Labium	wide	wide
Maxillar boss	♂: distinct, ♀: indistinct	?
Apex of sternum	truncate	truncate
Femoral spines	I — II: 1 dorsal	?
Patellar spines	1 long dorsal	1 dorsal
Tib. & met. v. sp.	I — II: none, III — IV: 1 — 2 + 2	2 + 1
Tibial dorsal spines	2	2
Additional metatarsal spines	apical ring + III — IV: 1 prolat.	apical ring
Tarsal trichobothria	1 indistinct	?
Colouration of legs	annulated — unicolorous	annulated
Cymbium	circular with basolateral furrow	♂ unknown
Tibial processes	large apical, distally branched	
Patellar processes	basal, caudally pointed hook	
Origination of embolus	basal (thin circular)	
Conductor	absent	
Median apophysis	absent	
Epigynal plate	caudal transversal	caudal transversal
Epigynal foveae	small anterior	? large lateral
Vulval ducts	thin double coil	?
Seminal receptacula	large globular	?
Distribution	S. Neotropical	S. Neotropical

Agelenidae, but the placing must remain obscure until additional information about the colulus, female genitalia, etc. is available.

Symposia

ROTH (1967) listed 5 Neotropical species of this genus, but, in my opinion only *S. sexoculata*, *S. dubiosa*, and *S. silvicola* belong to this genus. Both male and female genital organs are quite exceptional in structure, while the other characters afford no distinct proof of relationship with any named group of Amaurobioidea, although its superfamilial affiliation seems to be undisputed. ROTH (*op. cit.*) emphasized the reduced number of eyes as characteristic of this genus, but the present revision shows that the reduction of anterior median eyes has occurred along several lines in Amaurobioidea.

Tandil

This is another six-eyed Neotropical genus, but the original description mentions the presence of a bipartite cribellum. While information about most of the important characters, especially the genital organs, is totally lacking, this genus cannot be placed, although it is evidently a representative of either Amaurobiidae or Dictynidae.

B. Lycosoidea

The derivative types of Amaurobiidae have not yet been sufficiently well analyzed to be included in a detailed phylogenetic classification parallel to that presented here for Amaurobioidea. Lycosoidea still includes some Cribellate genera, but they constitute an insignificant minority in this large superfamily. Thus a more

Table 39. Amaurobioidea incertae sedis.

	<i>Callevopsis</i>	† <i>Eocryphoea</i>	<i>Symposia</i>	<i>Tandil</i>
Figure	96	PETRUNKEVITCH (1946, 1958)	93, 95	MELLO-LEITÃO (1940)
Size	medium	small	small	medium
Cribellum - colulus	cr: large undivided	co: ?wide oval trans- versal	co: semicircular	cr: bipartite
Pattern of spinnerets	thick BP	long and slender	BP	BP
Abdominal pattern	modified BP + white anterolateral stripes	?	obscure BP	simple BP
Fovea	wide subcircular pit	short	short and shallow	long
Size of AM	subequal to PM	< PM	absent	absent
Shape of MOT	quadrangular	wide trapezoidal	-	-
Labium	as long as wide	wide	as long as wide	long
Cheliceral teeth	2 - 4 + 3	?	4 + 3	5 + ?
Apex of sternum	continuous to petiolus	short, pointed	widely truncate	pointed
Tib. & met. v. sp.	1 + 3 (all spines very short)	3 + 3	2 + 2	3 + 2
Tarsal trichobothria	2 short indistinct	BP (4 - ?)	2	?
Feathery hairs	absent	absent	absent	absent
Trochanteral notch	absent	absent	absent	?
♂ palpal specialities	♂ unknown	cymbium rounded; tibial apophysis long and narrow; embolus short apical spine; protruding basal te- gular apophysis	cymbium with long apex and serrate caudal projection; palpal tibia with apical lobes; embolus apical, thick hook; homology of the other part uncertain	♂ unknown
Epigynal plate	large caudal trapezium	♀ genitalia unknown	tongue-shaped projection of the anterior margin	?
Probable affinities	abd. pattern: <i>Porteria</i> ; epigyne: <i>Anisacate</i> ; hair pattern: Dictyninae	♂ genitalia: <i>Melpomene</i> ; eyes, spinnerets: Agelenidae	?	?
Distribution	SW. Neotropical	† Baltic amber	N. Neotropical	C. Neotropical

detailed discussion of the true relationships of Cribellate and Ecribellate Lycosoidea would also be mere speculation.

According to all previous authors the superfamily differs greatly from the correspondingly named group as limited in this paper. PETRUNKEVITCH' (1958) Lycosoidea is almost identical with the three-clawed Amaurobiides, when spiders with a reduced number of cardiac ostiae have been excluded. CAPORACCO's (1938) Lycosaeformia included neither Cribellate nor two-clawed groups. BRISTOWE (1938) listed an almost identical group as Section D in his Clubionoidea, but curiously enough he included in this group Zodariidae with both two- and three-clawed species. MELLO-LEITÃO (1941 a) changed the name to Lycosoidea, but left the limitation by BRISTOWE (*op. cit.*) unaltered. He even presented intermediate genera between several pairs of his Lycosoid families (MELLO-LEITÃO *op. cit.*, p. 107): »Formam estas familias, apesar das frisantes diferenças entre as suas formas mais típicas, uma série regular e contínua: *Portima* liga os Agelenidae aos Lycosidae, *Staberinus* une os Pisauridae aos Oxyopidae, *Cy-*

baeodamus e *Valcheta* estabelecem uma transição dos Agelenidae para os Zodariidae, e os Hahnidae e Argyronetidae são considerados por SIMON como sub-familias de Agelenidae; *Moenchausiana* e *Glieschiella* são intermediários entre Lycosidae e Zodariidae». Such a pattern of phyletic relationships, however, is theoretically impossible.

My Lycosoidea consists of the families Dolomedidae, Lycosidae, Zoridae, Cycloctenidae, Ctenidae, and Selenopidae. The limitation of Ctenidae and Zoridae in particular is different from the usually accepted one. This group seems to be derived from an ancestral branch of Amaurobioidea that has also given rise to Amaurobiidae, Liocranidae, and Miturgidae (cf. Fig. 11).

Lycosoidea is characterized by the presence of a membranous secondary conductor in the male palpus, a general trend towards modification of the eye pattern to three rows instead of the usual two, increase in the average size, absence of feathery hairs (except in *Hestimodema*), and predominance of lateral lobes in the epigyne instead of the usual central plate.

Table 40. Families of superfamily Lycosoidea.

	Dolomedidae	Lycosidae	Zoridae	Cycloctenidae	Ctenidae	Selenopidae
Size	small – very large	small – large	small – large	medium	medium – very large	large
Average size	large	medium	medium	medium	very large	large
Colulus (cribellum)	unpaired projecting plate	unpaired hairy area – plate	unpaired variable (– cr)	reduced to a few setae	unpaired separate plate (– cr)	paired hairy area
Pattern of spinnerets	BP – lengthened	BP – PS lengthened	BP – slender BP	BP	BP	short BP
Median spinnerets	short cylindrical	as long as AS, cylindrical	as long as AS, cylindrical	short cylindrical	± triang., variable length	large flattened semicircular
Abdominal pattern	usually fused into longitudinal bands	BP of Amaurobioidea with moderate variations	BP of Amaurobioidea with moderate variations	BP of Amaurobioidea – obscure	variable, but can be referred to BP of Amaurobioidea	central folium (+ spotted)
Shape of abdomen	oval, caudally tapering	oval	oval	oval	oval – flattened pentagonal	flattened wide oval
Eye pattern	3 rows: 4 + 2 + 2	3 rows: 4 + 2 + 2	2 – 3 rows (4 + 4 or 4 + 2 + 2)	3 rows (2 + 4 + 2)	3 rows (2 + 4 + 2)	2 – 3 rows (4 + 2 + 2 or 6 + 2)
Size of eyes	anterior < posterior	anterior < posterior	quite variable	anterior < posterior	AL usually strictly smallest PL usually strictly largest	PL strictly largest, anteriors usually small
Width of clypeus	usually very wide	low to moderate	variable, usually low	wide	usually low	very low
Shape of carapace	variable	± pear-shaped	± pear-shaped	wide pear-shaped	wide pear-shaped	wide flattened
Maxillae	apically thickened and rounded, totally convex	short, laterally and apically rounded	± oval, length variable	± oval	longer than wide, often laterally excavated	long oval
Sternum	usually longer than wide, caudally pointed	usually longer than wide, caudally pointed	variable, but often subcircular, caudally obtuse	as wide as long, caudally obtuse	variable, but often subcircular, caudally obtuse	wide, caudally with double rounded apex
Ventral rows of spines mt-tib. I	seldom present	sometimes present	regular	absent	regular	seldom present
Tarsal trichobothria	2 ± regular rows	variable, often 1 uneven row	2 regular – irregular rows	2 ± regular rows	2 – 4 ± irregular rows	numerous irregular apical
Tarsal claws	3, rarely two	3	2 or 3	3	2 (or reduced unpaired claw)	2 ± toothless
Claw tufts	weak or none	none or very weak	unpaired longitudinal	unpaired longitudinal	paired ± vertical (dense)	paired ± vertical (dense)
Trochanterae	distinctly notched	distinctly notched	distinctly notched	unnotched	± distinctly notched	distinctly notched
Palpal tibia	modified with 1 – 3 processes	cylindrical unarmed	variably modified	branched process	variably armed (usually 1 process)	strongly modified
Type of embolus	usually very long and thin, strongly coiled	short curved spine	variable, sometimes fused to conductor	short modified lamella	quite variable	thin semicircular
Primary conductor	well developed	well developed	absent	± well developed	absent (– raised tegular margin)	in tegular margin
Secondary conductor	well developed	well developed	well developed	well developed	well developed	± reduced
Median apophysis	present	present	present	present	present	present
Epigynal structure	lateral lobes	usually caudal plate or septum	lateral lobes (+ central plate)	caudal plate + lateral teeth	quite variable	lateral lobes
Vulval structure	rather complicated	variable	usually strongly coiled	rather simple	rather simple	rather simple
Mode of prey catching	hunting (+ web) in chelicerae	hunting (+ web) in spinnerets	hunting in spinnerets	hunting in spinnerets	hunting in chelicerae (– fixed)	hunting ?
Cocoon carrying			in spinnerets (– fixed)			
Special characters	sometimes amphibious	palpal organs compact	both eye rows recurved; feathery hairs present in <i>Hestimodema</i>	–	sometimes with rows of hair tufts; AL usually oval	whole spider strongly flattened
Distribution	world-wide	world-wide	world-wide except Ethiopian	Australian-Oriental	world-wide in tropical and subtrop. zones	world-wide in tropical and subtrop. zones

As in all derivative branches of Amaurobiides, the use of webs for catching the prey is quite rare; up till now such webs are known to occur only in some Dolomedids and in Lycosidae: Hippasinae. As in many other groups of hunting spiders, the trochanterae of almost all Lycosoidea are distinctly notched.

Lycosidae constitutes a large and widely distributed family, and most of its genera can be placed correctly without difficulty, while the limitation of Ctenidae, Dolomedidae, Zoridae, and Cycloctenidae varies in different authors. Overemphasis of the taxonomic value of the eye pattern, especially by C. L. KOCH (1837), HERMAN (1878), SIMON (1892–1902) and BÖSENBERG & STRAND (1906) has caused least confusion in Ctenidae and Lycosidae, because their exceptional eye patterns are fairly stable.

Dolomedidae

Dolomedes and its exotic relatives have generally been listed in Pisauridae since SIMON (1898 a), although their affinities with Lycosidae have also been repeatedly emphasized. In my opinion, an intermediate eye pattern between the basic Agelenid type and the Lycosid type as such does not justify uniting Thaumasiinae and Thalassinae to Pisauridae, especially as the eye patterns of these groups are not at all identical with that of Pisaurinae. Most of the genera of Thaumasiinae auct. are here regarded as constituting the family Dolomedidae. The name Dolomedae was used by SIMON (1898 a), and the genus *Dolomedes* is well-known when compared with *Thaumasia*. Therefore, Dolomedidae seems to be by far the most appropriate name for this new family.

The genital pattern of Dolomedidae agrees well with the basic pattern of Lycosoidea. The male palpal organs of Dolomedidae are less compact than those of Lycosidae, and the embolus especially is long and strongly coiled. The tibial apophysis is also normally well developed. On the other hand, the presence of feathery hairs, the largely different basic abdominal pattern, and the lack of a secondary conductor in Pisauridae s. str. (= Pisaurinae auct.) seem to prove that there is no close phylogenetic relationship between the subfamilies of Pisauridae auct. CROME (1955 b, p. 607) found an additional fundamental difference: »Ein Vergleich der beiden Pisauriden-Arten zeigt, wie ein und

dasselbe Grundschema der Rückenzeichnung (die seitlichen Längsbinden) auf verschiedene Weise entstehen kann: bei *Pisaura* durch Pigmentreduktion, bei *Dolomedes* durch Pigmentfusion». However, he did not consider it phylogenetically significant.

The phylogenetic position of the classical Pisaurine subfamilies was revealed at a late stage of this revisional study, and a thorough revision of Dolomedidae could not be performed. It is possible that some Dolomedid genera have been listed in Pisauridae: Pisaurinae, or even in some other families, e.g., in Lycosidae. Some of the genera that have been preliminarily revised, have been placed according to the original description only, and the discovery of generic synonyms is still to be expected.

The type genus, *Dolomedes*, is generally regarded as world-wide. As repeatedly stated during this revision, there are no primarily world-wide genera in terrestrial spiders, and *Dolomedes* would hardly be an exception. Besides, a superficial analysis of a number of species that have been assigned there distinctly shows that most of them are no close relatives of *D. fimbriatus*. A few genera that have often been listed in Pisauridae: Thaumasiinae have been transferred to other families of Lycosoidea, mainly Zoridae (see Chapter III), while the following genera are catalogued here as constituting the family Dolomedidae: *Aglaoctenus*, *Archipirata*, *Demolodes*, *Dolomedes*, *Dyrines*, *Eucamptopus*, *Hesydrimorpha*, *Hesydrus*, *Hygropoda*, *Ilipula*, *Nukuhiva*, *Papakula*, *Paradossenus*, *Tapinothele*, *Tapinothelella*, *Teippus*, *Thaumasia*, and *Vorapitipus*.

No subfamilial division is proposed here for Dolomedidae. For the Thalassine genera *Thalassius* and *Ancylometes*, see Ctenidae.

Lycosidae

The wolf spiders constitute a considerable part of the spider fauna in all parts of the world, and their ecological niche is not generally occupied by other families of spiders. They are always characterized by an eye pattern of 4 + 2 + 2, a more or less distinct abdominal pattern of Amaurobioid type, the lack of tibial apophyses in the male palpus, and by the attachment of the cocoon to the spinnerets. Zorinae, Bradystichinae, Rhoicininae, and Cyclocteninae have often been included in Lycosidae, although they do not share the above

characters with this family. The position of these groups has been discussed elsewhere in this paper.

As in Ctenidae, the characters generally used in characterizing the Lycosid subfamilies have been simple structures having a tendency to convergent evolution. The subfamily Hippasinae is an exception, and evidently it constitutes the most primitive subfamily that has at least partly preserved web-spinning habits.

The well-known Holarctic genera seem to be correctly grouped with Lycosinae and Pardosinae, while the placing of most of the exotic genera has almost always been done according to a single character. Besides, hundreds of species with no close relationship to the generotype, or even to the subfamily Lycosinae, have been assigned to the type genus, *Lycosa*.

The limitation of genera has been more a matter of tradition in Holarctic Lycosids than in many other well-known groups of spiders. Thus the huge genus *Pardosa* has been preserved undivided even in an excellent and quite recent revisional study by TONGIORGI (1966). In fact the only feature common to all groups in this genus is the steeply raised cephalic area, while the genital organs are largely dissimilar. On the other hand, the European *Lycosa* has long been split into *Lycosa*, *Trochosa*, *Arctosa*, *Allohogna*, *Leaena*, etc., and different authors have limited these in various ways (see PALMGREN 1939, LOCKET & MILLIDGE 1951, and LUGETTI & TONGIORGI 1966).

Zoridae

The well-known Holarctic genus *Zora* has repeatedly caused trouble in the classification of spiders. It has sometimes been included in Lycosidae (DAHL & DAHL 1927) because of a strikingly similar general appearance, sometimes in Clubionidae: Liocraninae (SIMON 1897) obviously because of weakly developed scopulae, most often in Ctenidae: Acantheinae (e.g., PETRUNKEVITCH 1928) on account of the numerous ventral spines of the anterior tibiae and metatarsi. It has also been regarded as a separate family (TULLGREN 1945 and others).

The exotic relatives of *Zora* are still not well-known, and they have been listed in various groups, according to how the different characters have been weighed.

Since all the type material of Cteniform Lyco-

soid spiders in most of the European museums has already been examined, it is evident that there is a world-wide group of mainly small and medium-sized spiders that are more or less closely related to *Zora*. These genera have most often two claws and no well-developed claw-tufts of Ctenid type, but in several genera the primary Araneomorph pattern with three claws and no claw-tufts has been preserved.

This group is here called Zoridae, but its limitation is largely different from that of all those groups in which the type genus has been placed. This family is further characterized by a peculiar eye-pattern, which is actually intermediate between the basic patterns of Agelenidae and Lycosidae, and less similar to the typical Ctenid eye-pattern. There is some intergeneric variation, but usually the anterior row of eyes is straight or slightly recurved, while the posterior row of eyes is strongly recurved. The anterior lateral eyes are about equal in size to the anterior median ones, and in contrast to the corresponding eyes of most Ctenids, distinctly circular.

The presence of strong ventral spines on the anterior tibiae and metatarsi is characteristic of most of the Zorid genera, but their number cannot be used as a key-character. This character is highly adaptive, and it has independently developed in numerous other lineages of Amaurobioidea and Lycosoidea (e.g., *Acantheis*, *Acanthoctenus*, *Acantholycosa*, *Dirksia*, *Obatala*, and *Tuberta*).

As in *Zora*, the pattern of both carapace and abdomen is usually very distinct in Zoridae, but it is of the same basic type as in any group of Amaurobiides, and as such it is not available as a true key-character.

The genital organs of most Zorid species are surprisingly similar to each other. When they are compared with those of other families of Lycosoidea, the presence of more or less strongly coiled vulval ducts is especially characteristic of Zoridae, while the male genital organs rather resemble those of some Ctenid species. As far as I know, the primary conductor is strongly reduced in Zoridae, while the embolus is on an average long and circular, that is, corresponding to the primitive type of Amaurobiides.

The presence of feathery hairs in *Hestimodema lalévittata* is unique in the representatives of Lycosoidea studied by myself. However, this species is certainly related to the generotype of *Hestimodema* and to *Odomasta*, at least, and its placing in Zoridae seems to be incontrovertible.

The inclusion of the Cribellate genera *Zoropsis* and *Takeoa* in Zoridae causes a nomenclatory problem, as the family name Zoropsidae is both older and much more current than Zoridae. However, the name Zoridae has been preferred here, because the familial affiliation of these Cribellate genera is not undisputed, while there are certainly enough of the numerous close relatives of *Zora* to comprise a family, in spite of the fact that some groups of my Zoridae may later be proved to belong elsewhere. It is also certain that Zoropsidae auct. is a strictly polyphyletic group representing only an assemblage of two-clawed Cribellate spiders from several lineages of Amaurobioidea and Lycosoidea.

Zoropsis fits well into Zoridae according to the eye and spine patterns, nor is the genital structure in conflict with the basic type of Zoridae, although the latter character is similar in most Lycosoidean groups. On the other hand, the claw tufts of *Zoropsis* are exceptionally well-developed, having reached the same stage as those of most Ctenid and Selenopid species. *Takeoa* is a rather close relative of *Zoropsis*, but the differences in genital patterns seem to be sufficient to justify the creation of this new genus distributed far away from the centre of speciation of *Zoropsis*.

For reasons listed in connection with Dolomedidae, a complete revision of Zoridae has not been possible. Probably there are at least three subfamilies, but no additional new taxa are proposed here. The affinities of some genera with each other can easily be detected, and the following preliminary grouping is given:

Group I:

- A. *Simonus* - *Thasyraea* - *Voraptus* - *Zoroides* (Australian - Oriental - Malagasy)
- B. *Zora* (Holarctic)
- C. *Diallomus* - *Hestimodema* - *Odomasta* (Australian - Oriental)
- D. *Argoctenus* (Australian)
- E. *Zoica* (Oriental)

Group II:

- Neoctenus* - *Odo* - *Tunabo* (Neotropical)

Group III:

- Zoropsis* - *Takeoa* (Palearctic)

The second, entirely Neotropical group is characterized by much larger size on an average and an almost Lycosid type of eye pattern. It

is also possible that this group should be placed elsewhere, for instance, as a deviating branch of two-clawed Lycosids or close to Ctenidae: Thalassinae.

The two minute species of *Zoica* have hitherto always been listed in Agelenidae. As the small species of spiders in the Oriental region are not well known, it is possible that there are numerous relatives of this genus in the soil fauna of that region.

The affinities of Zoridae with the other Lycosoidean families remain uncertain, because there are repeated possibilities of parallel evolution in the characters discussed above in connection with the limitation of Zoridae. In any case, it seems to be finally proved here that the reduction of the unpaired tarsal claw has occurred independently in several different lineages of Lycosoidea. Therefore this classical character cannot be used in compiling the natural classification of this superfamily.

The Amaurobid subfamily Stiphidiinae has an eye pattern that is strikingly similar to that of some Zorid species, e.g., *Zoica*. In spite of the curiously modified male palpal organs of *Stiphidion*, the derivation of Stiphidiidae and Zoridae from a common ancestral group is not impossible, although this alternative is not considered the most probable one. The presence of feathery hairs in both *Hestimodema* and *Stiphidion* must also be remembered when the affinities of these Australian groups are discussed.

Cycloctenidae

The three-clawed Australian genus *Cycloctenus* with its typical Ctenid eye pattern has previously been included in several different families (see p. 227). The presence of a median apophysis and a secondary conductor exclude the possibility of relationship with Toxopidae, while these characters confirm the affinity with other families of Lycosoidea.

Cycloctenus is here tentatively placed in a separate family. This opinion is further supported by the Lycosid method of cocoon-carrying, the presence of unnotched trochanterae, and the deviating structure of the epigyne and male tibial apophyses. By some standards, Cycloctenidae could be included in Ctenidae as a subfamily, but the strikingly similar eye pattern may also be due to parallel evolution.

I have not personally examined representatives of the New Zealandian genus *Toxopsiella*, but

according to the figures given by FORSTER (1964 b) it evidently belongs to Lycosoidea. On the other hand, only females are known of the Indonesian genus *Galliena*. These two genera are certainly related to each other and to the generotype of *Anoteropsis*, but their placing remains obscure. They constitute a derivative group of either Lycosidae or Cycloctenidae.

Ctenidae

Although SIMON (1897, p. 104) did not use the name *Dionycha*, he strongly emphasized the taxonomic significance of the number of tarsal claws, and thus, e.g., he fundamentally misinterpreted the relations of Ctenids, as we see when we compare his opinions with those prevailing before his classical system was drawn up: «Les *Ctenus*, que presque tous les auteurs rapprochent des *Lycosa* et des *Dolomedes*, me paraissent cependant beaucoup plus voisins des *Sparassus* et des *Clubiona*.» It is also surprising that he did not suggest relationship between Cteninae and Selenopinae, although the latter are both two-clawed and laterigrade, and they are here stated to be members of the same superfamily, Lycosoidea.

The similarity in general appearance between many classical Pisaurid species and Ctenids has sometimes been emphasized even since SIMON's classification, for instance by F. O. PICKARD-CAMBRIDGE (1898) and S. LUCAS (1964), and the corresponding similarity between Zoropsidae auct. and Ctenidae was pointed out by PETRUNKEVITCH (1923 and later). Cf. also footnotes 1 and 2 by SIMON (*loc. cit.*) himself. All these authors, however, have preferred tradition to the necessary reclassification of Ctenidae.

The revision of Ctenidae is greatly hindered by the obscurity of the status of the generotype of *Ctenus*, *C. dubius* Walck. 1805. There is no material of this species, and all the later references to it are based on the original poor description or on a similar later one by WALCKENAER (1837, p. 366) himself:

«Ctène douteux. (*Ctenus dubius*) Long. 9 lignes, ♂. Mandibules ayant une reflet bleu azuré, violet. Corselet rouge ferrugineux, bordé d'une ligne jaune sur les côtes. Pattes ferrugineuses, annelées de taches obscures peu marquées, et revêtues de piquants très-longs. (Collection de l'ancienne Société d'hist. nat. de Paris.) Ctène douteux, Walckenaer, Tabl. des Aranéides, 18, Pl. 3, fig. 22. Nouveau-Monde – Amér. septent. – Cayenne. Les mâchoires ont aussi un reflet bleuâtre. Le corselet est large, peu allongé. Les pattes sont étendues latéralement. Les yeux intermédiaires de la seconde

ligne sont les plus gros. La première paire de pattes est plus longue que la seconde; sa longueur est de onze lignes (la quatrième manque); la troisième est la plus courte.»

The above description seems to fit a number of species corresponding to various modern genera of Ctenidae, and there is no evidence even of the absence of a cribellum.

According to BONNET (1961, p. 45), 234 species of *Ctenus* had been described by 1939. Most of them have been mentioned only once in arachnological literature, and none of them seems to be well known, or at least well represented in collections. Since 1939, numerous additional species have been assigned to *Ctenus* and numerous well-defined genera have been synonymized with it. All this seems to be highly absurd, as there are no common standards for authors working in different parts of the world, and the generic criteria presented do not take into account any of the more complicated characters, e.g., the genital organs (SIMON 1897, p. 112 and 114; F. O. PICKARD-CAMBRIDGE 1898, DES ARTS 1912, p. 183, and MELLO-LEITÃO 1936 b, 1939).

Recently, BÜCHERL *et al.* (1964) presented a redescription of *Ctenus* and *Phoneutria*, based on a study of hundreds of specimens, but their paper included not a single specific name and, according to their revision, it is impossible to know to which known taxonomic units their *Ctenus* must be referred. In any case, they are the first authors to mention an unambiguous genital pattern for *Ctenus*, and if my opinion concerning the complete obscurity of the status of *Ctenus dubius* is generally accepted, the only reasonable decision is to select a new generotype for the genus *Ctenus* sensu Bücherl *et al.*

Concerning the limitation of Ctenidae, see also Zoridae and Miturgidae.

MELLO-LEITÃO (1936 b, 1939) summarized the characters generally used for subfamilial and generic criteria in Ctenidae. Until now, all revisional studies on Ctenidae have been based on differences in the shape of maxillae and labium, number of tibial spines, and number of cheliceral teeth – all very simple characteristics that are found to give rise to repeated patterns of convergence in any group of spiders.

The subfamilial division of Ctenidae by MELLO-LEITÃO (1939, p. 139) is throughout very unnatural, and the preliminary revision carried out during the last phase of the present study has shown that there are at least four more

Table 41. Ctenidae: subfamilies.

	Thalassiinae	Viridasiinae	Cteninae	Acanthoeteninae
Size	very large — large	very large	very large — large	medium — very large
Cribellum — colulus	co: unpaired ± triangular	co: broad transversal plate	co: ± triangular (— semi-circular)	cr: bipartite or undivided—co: variable undivided
Abdominal pattern	lateral longitudinal bands — obscure	obscure	obscure BP	BP — variably modified
Shape of abdomen	long oval, caudally gradually tapering	oval	oval ± unmodified	usually ± modified: flattened, caudally abruptly tapering or subpentagonal
Hair pattern of abdomen	usually with rows of white hair tufts or other strikingly deviating areas	evenly covered with coarse and fine hairs, the latter exceptionally scarce	evenly covered with long setae, coarse hairs and numerous fine hairs	usually with two longitudinal rows of distinct white hair tufts
Profile of carapace	straight or weakly notched	rather flat, throughout weakly convex	straight, caudally ± abruptly sloping	usually distinctly notched
Shape of AL	circular	oval	oval	oval, seldom circular
Shape of MOT	± rectangular	subrectangular	usually trapezoidal	usually rectangular
Labium	long, widely truncate	short, weakly notched	usually longer than wide, notched	usually short, rounded or truncate
Sternum	variable, caudally shortly pointed	subcircular, caudally with obtuse angle	variable, often longer than wide	usually wider than long, apex obtuse
Tib. & met. v. sp. I	3 — 4 + 3	4 + 3	3 — 5 + 3 — 4	(5 —) 6 — 10 + 3 — 6
Tarsal claws	usually 3 (or unpaired strongly reduced)	2	2	2
Structure of paired tarsal claws	falciform, with numerous long teeth	very long, with a few minute teeth	usually strongly curved, teeth short	long falciform, teeth variable
Claw tufts	often weakly developed	very dense vertical	very dense vertical	usually very dense vertical
Tarsal trichobothria	one row + apically 3 — 5 diverging rows	apically 3 diverging rows	apically 3 diverging rows (+ 1 row)	apically 2 — 3 diverging rows (+ 1 row)
Length ratio metatarsus/tarsus	2 — 2 ½	1 ½ — 2	2 — 3	2 — 3 ½
♂ palpal tibial processes	1 simple lateroapical	the whole tibia strongly modified	1 lateroapical	usually 1 lateroapical
Embolus	quite variable	laminar, fused to conductor	quite variable	quite variable
Primary conductor	usually present	fused to embolus, apex hooked, free	totally reduced	± totally reduced
Secondary conductor	membranous	membranous	membranous	membranous, often modified in shape
Median apophysis	present	present	present	present
Epigynal plate	usually narrow, not hairy	hairy longitudinal plate	hairy longitud. plate with basal dilatation	(epigyne often strongly modified)
Lateral teeth	large longitudinal lobes	large, with fovea	usually present, ± acute subcaudal	usually absent, sometimes small caudal
Distribution	World-wide in the tropical and subtropical zones	Malagasy	Southern hemisphere + adjacent areas	Southern hemisphere + adjacent areas, mainly Neotropical

or less well defined lines in the evolution of Ctenidae. Unfortunately, no thorough analysis of this problem has been possible yet, and many of the genera could not be placed at all.

It is not surprising that MELLO-LEITÃO (1936 a, 1936 b) confused some Cribellate and Ecribellate species of Ctenidae with each other, as there are several lines of evolution in which the reduction of the cribellum can be traced in detail as in Amaurobioidea. Cf. also the notes of SOARES & CAMARGO (1949). Of the species that I have personally investigated, *Nothroctenus lineatus* (Tullg.) has no cribellum, although the genital organs are very close to the Cribellate species *N. marshii* (F. O. P.-Cambr.). Cribellate and

Ecribellate species have also been confused in the genera *Acantheis*, *Acanthoctenus*, *Asthenoctenus*, *Gephyroctenus*, *Paracanjeis*, and *Phymatoctenus* (see Chapter III), not to speak about the repeated confusion of the period of general neglect of the presence of cribellum.

All the species that have been included here in Ctenidae share the classical eye pattern of this family. That is, the eyes are situated in three rows (2 + 4 + 2), and the anterior lateral eyes are usually the smallest and more or less oval in shape. However, this character can not be used as an absolute key character, as a similar pattern is shared by at least some representatives of Cycloctenidae, and superficially

Table 42. Cribellate Lycosoidea.

	Zoridae		Ctenidae: Acanthocteninae			
	Zoropsis	Takeoa	Acanthoctenus	Viracucha	Gephyroctenus	Nothroctenus
Figure	399	403, 405	414, 420	415 - 416, 421	418; MELLO-LEITAO (1936 b)	417, 419
Size	very large - medium	large	medium - very large	very large - large	medium - large	large - very large
Cribellum ♀	bipartite very narrow	bipartite narrow	paired equilateral triangle	undivided long oval	bipartite small	undivided broad and narrow
Cribellum ♂	indist. bipartite, nonfunctional	indist. bipartite, functional	± reduced nonfunctional	obtuse triangle, non-functional	? (reduced)	± reduced, nonfunctional
Pattern of spinnerets	♂♀ strong conical	♂♀ strong conical	♀ conical, ♂ longer	♀ conical, ♂ longer	♂♀ slender subconical	♂♀ rather slender
Shape of abdomen	oval	oval	weakly flattened	wide oval	strongly flattened, distally tapering	± wide oval
Abdominal pattern	± BP of Amaurobioidea	obscure	± BP of Amaurobioidea	2 rows of dark spots	2 large white lateral spots	wide folium + transv. bands
Abdominal hair tufts	absent	absent	distinct in 2 longit. rows	± indist. in 2 rows	2 large lateral tufts	in 2 rows (distinct - indistinct)
Shape of thoracic area	oval	oval	wide oval	wide oval	subcircular	wide oval - subcircul.
Shape of cephalic area	long trapezoidal	long trapezoidal	short trapezoidal	short trapezoidal	short subrectangular	very short trapezoidal
Profile of carapace	straight	straight	weakly notched	straight	flat, strongly notched	moderately notched
Size of eyes	PM ≥ AL > PL > AM	AL ≥ PL > PM > AM	PL > PM ≥ AM ≥ AL	PL > PM ≤ AM > AL	PL > PM > AM ≥ AL	PL > PM ≥ AM ≥ AL
Eye row AL-PM	-(eyes in 2 recurved rows)	-(eyes in 2 recurved rows)	straight - weakly procurved	slightly procurved	slightly procurved	weakly procurved - straight
Shape of MOT	± quadrangular	± subrectangular	long rectang. - trapez.	long rectangular	long rectangular	quadrang. - trapez.
Shape of LOT	slightly trapezoidal	trapezoidal	± rectangular	slightly trapezoidal	trapezoidal	± rectangular
Cheliceral teeth	3 + 3	3 + 3	3 + 3	3 + 3	3 + 3	3 + 2 - 3
Labium	as long as wide, truncate	wide, notched	as long as wide, truncate	long, notched	as long as wide, truncate	wide - as long as wide
Sternum	longer than wide	longer than wide	subcircular	longer than wide	wider than long	wider than long
Apex of sternum	obtuse angle	distinctly pointed (short)	obtuse angle	caudal margin undulate	obtuse angle	obtuse angle
Tib. & met. v.sp. I-II	6 (+1 distal) + 3	7 (+1 distal) + 4	5 - 9 + 4 - 5	6 - 10 + 4 - 7	9 + 6	7 - 9 + 4 - 5
Femur I: prolateral spines	2 single subdistal	4 apical in a dense row	2 central	2 central	2 central	2 central
Tarsal trichobothria	irregular ± one row	2 short irregular apical rows	long in ca. 4 irregular rows	ca. 4 irregular rows	BP + apical irregular	BP + apical irregular
Tarsal scopulae	variable short	rather short and sparse	short and dense	rather long and dense	weak	short and dense
Trochanterae	III - IV rebordered - notched	I - IV rebordered	I - IV moderately notched	I - III distinctly notched	I - IV weakly notched	I - V distinctly notched
Cymbial modifications	apex short with inner furrow; basolateral swelling; apicodorsal scopula	apex short with inner furrow; basolateral excavation; dorsal face scopulated	apex long; basolateral rounded lobe; whole cymbium with dense hair covering	apex long scopulated; centrolateral excavation	adult ♂ unknown	apex long and scopulated; centrolateral tooth
Palpal tibia + processes	long cylindrical with lateroapical simple hook	laterally excavated with large subbasal process	curved cylindrical with lateroapical hook	strongly curved cylindrical with apical lobe or spine	subapical	apically variously modified, basal part cylindrical
Origination of embolus	central (externally not visible)	central (ext. not visible)	basal	basal	basal	basal
Structure of embolus	throughout fused to prim. cond. (between folded halves)	thick ± straight spine (running within prim. cond.)	gradually tapering curved spine	strongly modified lamina	strongly modified lamina	wide ± spirally coiled lamina with long thin apex
Primary conductor	large folded lamina	large cylindrical tube	protruding tegular margin	protruding tegular margin	protruding tegular margin	protruding tegular margin
Secondary conductor	narrow membranous	wide membranous	wide membranous	wide membranous	wide membranous	large folded membr.
Median apophysis	small scoop-shaped, apex notched	long and rather thick	long scoop-shaped, apex hooked	very large and complicated	very large and complicated	subapical folded lamina
Central epigynal plate	longitudinal septum, margin ± undulate	anterior semicircular	small posterior septum	T-shaped septum	narrow chitinous list	small caudal triangular
Epigynal specialities	lateral chitinous lobes	caudal lobes	anterior depression + caudolateral lobes (touching)	lateral lobes continuous with epigynal plate	reniform area limited by a narrow chitinous list	subcircular area limited to a chitinous list, continued as a paired spiral lamina
Special characters	fulcrum sometimes present	-	-	AL practically circular; palpal patella with apophysis	strongly flattened habitus	-
Distribution	S. & C. Palearctic	E. Palearctic	N. & C. Neotropical	C. Neotropical	C. Neotropical	C. Neotropical

almost identical ones by several other lineages of Lycosoidea, obviously as a result of a common trend.

Concerning the other characters that have been generally used in defining the families, subfamilies, and genera of Lycosoidea, there are no key-characters, although some of them are practical aids for identification of genera and species. As for all the groups that are here revised only preliminarily, no key-tables have been presented for Ctenid subfamilies and for most of the genera. The Cribellate genera have been more thoroughly revised, and thus a key-table (Table 42) has been compiled for their separation from each other, as well as from other Cribellate Lycosoidea.

Ctenidae is here preliminarily divided into four subfamilies, Thalassiinae, Viridasiinae, Cteninae, and Acanthotheninae (Table 41), but not all Ctenid genera described up to date could be placed in them, and the monophylety of Acanthotheninae at least is not self-evident. All but Viridasiinae have been previously used as family-group names, Thalassiinae has been earlier listed in Pisauridae, and Acanthotheninae either in Zoropsidae or as a family of its own.

My Thalassiinae includes the genera *Ancylometes*, *Cupiennius*, *Thalassiospis*, and *Thalassius*. All of them are mainly composed of three-clawed spiders, but the eye pattern, genital organs, and adaptive modifications of the legs are typically Ctenid. *Cupiennius* has usually been listed in Ctenidae, although the presence of the third claw was known already by SIMON (1897), while the other genera have been listed in Pisauridae by almost all authors of this century. However, S. LUCAS (1964) emphasized the relationship of *Ancylometes* to *Cupiennius*. It is also worth mentioning that many of the species of *Ancylometes* examined by myself are two-clawed spiders with well-developed claw-tufts.

The new subfamily Viridasiinae is possibly a close derivative of an extinct Cribellate branch of Lycosoidea. The colulus of *Viridasius* distinctly resembles a large transversal cribellum, except that the cribellar plate has become non-functional. Probably there are several species of this group in Madagascar and adjacent archipelagos.

The nominate subfamily, Cteninae, is mainly composed of very large spiders, and some representatives of the genus *Phoneutria* are the

largest spiders in Amaurobiidae, even, at least as far as the total weight is concerned, in the whole suborder. The epigynal plate is usually distinctly elevated and the lateral teeth or lobes are often present. The male palpus may have specialized structures in the cymbium, and the embolus is usually thick and modified as in Amaurobiidae. The tarsal claw-tufts are divided into two dense, almost vertical fan-shaped bundles, and the ventral scopulae of tarsi and metatarsi are exceptionally dense.

The limitation of different genera of this subfamily must be thoroughly checked, as most of the species have been described as representatives of *Ctenus* (cf. p. 375). *Corinoctenus*, *Ctenopsis*, *Isoctenus*, *Oligoctenus*, *Phoneutria*, and *Tuticanus* are more or less closely related to the type genus.

The limitation of Acanthotheninae is rather obscure when compared with that of the first three subfamilies. There are two distinct tribes of Neotropical genera, each consisting of both Cribellate and Ecribellate members, viz. *Acanthothenus* – *Asthenoctenus* – *Centroctenus* – *Phymatoctenus*, and *Nothroctenus* – *Gephyroctenus* – *Trujillina* – *Anahita*. The new Cribellate genus *Viracucha* is also certainly related to these two groups, while the position of *Acantheis*, *Africactenus*, *Caloctenus*, *Enoploctenus*, and *Leproctenus* remains somewhat uncertain.

Typical representatives of Acanthotheninae are characterized by more or less regular longitudinal rows of white bundles of long hairs on the abdomen, but this pattern has certainly been reduced in some lineages. The anterior metatarsi and tibiae are usually armed with numerous strong ventral spines, but this character cannot be used in keys because repeated parallelism has been confirmed among Amaurobiidae. HYATT (1954) emphasized the notched profile of the carapace as a characteristic of his Acantheinae, but this character is not absolute either, although sometimes useful in lumping related groups of species.

The reduction of the cribellum has also repeatedly occurred within Acanthotheninae, as demonstrated above by the limitation of known tribes of this subfamily. Besides, the structure of the cribellum is largely dissimilar in different Cribellate genera of Acanthotheninae, *Acanthothenus*, *Nothroctenus*, *Gephyroctenus*, and *Viracucha*.

The following genera are listed here as Ctenidae incertae sedis: *Apolania*, *Celaetycheus*, *Incasoctenus*, *Itatiaya*, *Pseudoctenus*, *Thoriosa*, *Troglo-*

clenus, and *Vulsor*. The eye pattern of *Apolania* is peculiar with strongly reduced anterior eyes, and the small size is also an exception among Ctenidae. *Celaetycheus* is also small, and the structure of the epigyne refers to relationship to *Cupiennius*, but this may be mere convergence. The genus *Vulsor* is restricted to Madagascar and adjacent archipelagoes of the Indian Ocean. The colulus of its species is a hairy, transversal bar, strongly resembling the cribellum of *Viracucha*, for instance. Most probably it is worthy of subfamily status, representing an additional lineage of Lycosoidea, in which the reduction of the cribellum occurred recently. Material of the remaining genera listed above has not been available for study but I have included them in Ctenidae on the basis of the original description.

For some additional genera that have usually been listed in Ctenidae, see p. 374.

Selenopidae

SIMON (1897) regarded Selenopinae as a subfamily of Clubionidae, but since then it has generally been listed as a separate family close to Sparassidae, seemingly on account of the laterigrade general structure (PETRUNKEVITCH 1923, BRISTOWE 1938, CAPORIACCO 1938). The phylogenetic value of the laterigrade type was most emphasized by MELLO-LEITÃO (1941 a) in uniting Heteropodidae (= Sparassidae), Thomisidae, Aphantochilidae, Platoridae, Selenopidae, and Trochanteridae to make the superfamily Heteropodoidea.

In my opinion, the derivation of Selenopidae from Ctenidae is obvious. Not only are the male and female genital organs, eyes, and hair covering of the legs of largely similar pattern, but there is also a striking resemblance in the outline of the carapace, sternum, labium, and maxillae as well as in the structure of the spinnerets when the results of strong dorsoventral flattening have been excluded.

Unlike that of the other representatives of Lycosoidea, the secondary conductor of Selenopids is not membranous, but the apical part of the tegulum is modified to a furrowed cone, while the primary conductor is also reduced.

The short tarsi of Selenopids are largely similar to those of Ctenids, except that the claws may be practically smooth. There is, however, a continuous series from distinctly toothed claws to smooth ones, and sometimes all the legs of a

single specimen are slightly different in this respect. The colulus is totally reduced, which is additional evidence of the advanced position of this family.

There may be several genera in Selenopidae, but their limitation is unknown to me, and a detailed revision of this family is outside the scope of this paper.

Genera incertae sedis

As a whole, the superfamily Lycosoidea is less thoroughly revised here than Amaurobioidea, and therefore a number of genera are listed here as incertae sedis. I have preliminarily examined material of *Anoteropsis*, *Dyrinoides*, *Hypsithylla*, *Syntrechalea*, and *Trechalea*. All these genera have sometimes been listed in Pisauridae: Thaumasiinae, but at least some of them may belong to Cycloctenidae or Zoridae rather than to Dolomedidae, although my Dolomedidae roughly corresponds to the subfamily mentioned. *Trechalea* is a rather well-known genus with several Neotropical species, while a single or a few specimens only are known of all the other genera discussed here.

No material of *Dyomonomma* has been available, but the original description is sufficient to place this genus in Lycosoidea where it probably belongs to Ctenidae.

C. Pisauroidea

Pisauridae s. str. (Pisauridae: Pisaurinae auct.), Oxyopidae, Senoculidae, and Homalonychidae all have feathery hairs, and a median apophysis is present in the male palpus. Moreover, none of them has a secondary conductor. The eye pattern is modified in all these families but it does not resemble the Lycosoidean types in any of the above-mentioned groups. The shape of the colulus varies somewhat, even within a single family, as in Oxyopidae, but it is never distinctly of bipartite origin (cf. Agelenidae).

These facts seem to indicate phylogenetic affinity of these four families, although the monophylety of this group cannot be finally proved. However, the phylogenetic affinity of Pisauridae and Oxyopidae seems to be undisputed, as there are several additional similarities between these two families: general trends in modification of the shape of abdomen and cephalothorax, the basic colour pattern, structure of trochanterae, and shape of spinnerets. In fact, the affinity of

Pisauridae and Oxyopidae has already been proposed by PETRUNKEVITCH (1923, p. 163 and 1933, p. 354), and his inclusion of Thalassinae and Thaumasiinae in Pisauridae explains the mentioning of Lycosidae as a close relative of these two families. In the former context, he also proposed a close relationship between Senoculidae and the group discussed here, while the presence of only two pairs of cardiac ostia in Senoculidae misled him later (PETRUNKEVITCH 1933, p. 351) into transferring this family to his suborder Quadrostiatae. Cf. also BRADY (1964).

The widely differing opinions concerning the taxonomic position of Homalonychidae (see p. 294) are evidently due to the fact that most of the arachnologists concerned have personally examined no material of this family. The presence of smooth tarsal claws has been emphasized as characteristic of Homalonychids only, but a gradual reduction of these teeth has also occurred in Selenopidae.

D. Isolated derivative groups

In addition to the well-defined superfamilies Amaurobioidea, Lycosoidea, and Pisauroidae, there are some minor groups of Ecribellate spiders which are certainly derivatives of the ancestors of the named groups, and which, therefore, can be included in the main branch Amaurobiidae. Besides, the relationship of some larger groups to this branch is probable, although not finally proved.

Titanoecidae

The well-known Palearctic genera *Titanoeca* and *Nurscia*, together with the Neotropical *Goeldia* and two new Oriental genera, *Pandava* and *Anuvinda*, constitute a compact group (Table 44) which is easily separated from all other Cribellate families. However, as all the Cribellate genera with a practically unmodified shape of abdomen and cephalothorax have generally been included in the single family Amaurobiidae, regardless of trichobothrial pattern, general colour pattern, and structure of genitalia, the position of *Titanoeca* and related genera has not been correctly interpreted before.

Titanoecidae was first mentioned as a separate family by myself (LEHTINEN 1964) without other argumentation than reference to a future description.

Representatives of Titanoecidae partly resemble Clubionidae s. str., and partly representatives of Gnaphosidae, Zodariidae and even some other families outside Amaurobioidea, while the similarities to any group of Amaurobioidea, except Phyxelidinae, are restricted to characters that represent the unmodified basic pattern of Araneomorpha: the presence of divided cribellum, generalized type of spinnerets proper, and the two-row eye pattern.

In order to convince the traditional phenetic taxonomists also of the fundamental differences in the characters of Titanoecidae and Amaurobiidae, the most important arguments are listed in Table 43.

The following notes make it still easier to understand the presence of deviating trends within these families. The fovea, trichobothrial pattern, and spine pattern tend to be reduced in small representatives of Amaurobioidea, but such a reduction is never found in average-sized species of Amaurobiidae, still less in species of

Table 43. Comparison of Titanoecidae and Amaurobiidae.

	Titanoecidae	Amaurobiidae
Abd. colour pattern	two rows of well-defined white spots - unicoloured	basic pattern of Amaurobiidae (Figs. 42 - 47)
Shape of abdomen	short oval, caudally $\pm$ rounded	oval, caudally tapering
Fovea	insignificant depression as wide as the area of spinnerets proper	longitudinal furrow narrower than the area of spinnerets proper
Cribellum	none or short, indistinct, of equal length	basic pattern of Amaurobiidae (one row, distally increasing in length)
Tarsal trichobothria	one subapical + indistinct basal ones	complicated pattern of distinct trichobothria
Metatarsal trichobothria	strongly reduced, δ with several ventral rows of short spines on metatarsi and tibiae of I - II, femoral spinulation scanty	no sexual dimorphism, basic pattern of Amaurobiidae
Spine pattern of legs		
Calamistrum	a single row	a single row + pseudocalamistrum
Epigyne	simple paired fovea + median septum	variable, often with central plate
Vulva	with spiral ducts	often simple with globular receptacula
Palpal tibia	with folded lateroapical apophyse complex	lateral processes + ventral carina
Functional conductor	tegular furrow	primary or secondary conductor
Embolus	thin apical coil	variable, often longitudinally coiled
Median apophysis	basal with pointed apical part	variable, often $\pm$ spoon-shaped
Sexual dimorphism	leg spinulation + cheliceral modifications	length of legs, shape of cribellum
Tracheal distribution	cephalothorax and abdomen	variable
Web	irregular three-dimensional	funnel type
Cocoon	globular, hangs in the web	planoconvex - globular, usually cryptic
Habitat preference	strongly thermophilous	$\pm$ hygrophilous and troglophilous

Table 44. Titanocidae.

	<i>Titanoeca</i>	<i>Nurscia</i>	<i>Anuvinda</i>	<i>Pandava</i>	<i>Goeldia</i>
Figure	423 - 424, 427 - 429, 432, 434 - 437	430 - 431	441	426, 440	422, 438 - 439, 442
Size	medium - small	large - medium	large	medium	medium
Abdominal pattern	♀ none, ♂ none - obscure	2 rows of white spots	none	none	± indistinct folium
Fovea	indistinct	wide, rather deep	wide and deep	shallow	shallow - indistinct
Size of AM	subequal to PM	variable	> PM	subequal to PM	variable
Shape of MOT	trapezoidal	variable	wide rectang.	± trapezoidal	variable
Cheliceral teeth	2 + 3	2 + 3	2 + 3	2 + 3	2 + 3
♂ chelic. modifications	lateral irreg. teeth	lateral irreg. teeth	?	lengthened	lengthened, with longit. furrows
Labium	variable	variable	long	♀ long, ♂ very long	♀ as long as wide, ♂ long
♂: tib. & met. v. sp. (I)	2 - 6 rows of short spines	2 rows of short spines	?	4 + 5 pairs of long spines	tibia: irreg.; met: 3 pairs (long)
♀: tib. & met. vsp.	1 - 2 + 3 - 4	2 + 3 - 5	1 + 4 - 6	0 - 2 + 3	apical rings (+ irregular)
Femoral spines	♀: 0(-2), ♂: (0-2)	♀: 0 - 1, ♂: 1 - 2	♀: 2 - 3	♀: 0, ♂: 0 - 1	♀: 0, ♂: 0 - 1
Tarsal spines	♂: 0 - 5 (esp. III-IV)	♂: III-IV: 1 - 3	none	none	♂: I-II: 0 - 1
Length of apical met. trichobothria	variable	1 - 2 Ø mt	1 Ø mt	1 ½ Ø mt	< Ø mt
Cymbium	basodorsal carina	basodorsal carina	♂ unknown	mesally notched	basally widely truncate
Shape of palpal tibia	strongly modified	cylindrical-oblique		obliquely attached	almost transversal
Folded tibial lamina	variable	triangular-oval		rounded	rounded
Other tibial processes	single, apic. pointed	twisted, later. pointed		3 laminae	2 laminae
Patellar processes	none	patella long, club-shaped		none	± triangular
Shape of embolus	strongly coiled, long	semicircular geniculate		semicircular	semicircular
«Conductor» (tegular margin)	with basal notch	swollen furrow		thick swollen furrow	low swollen furrow
Median apophysis	oval with acute apex	oval with acute apex		short rounded	apically twisted
Epigynal septum	caudal triangle or bar	longitudinal, long	longitudinal, short	well limited long plate	very wide
Epigynal foveae	small caudal	large, longit. oval	wide oval	small anterior	small lateral, widely spaced
Vulval structure	thick double U-type with internal spiral	geniculate double U-type	strongly coiled	three narrow pairs of ducts	three narrow pairs of ducts
Special characters	folded tibial lamina basally surrounding the other process	-	-	cymbium ectally protruding	-
Distribution	Holarctic (especially mountains)	Palaearctic	Oriental - E. Mediterranean	Oriental - N. Australian (Polynesia)	Neotropical

the size of, e.g., *Nurscia albosignata* or *N. sequeirai*.

Both these families share the sexual dimorphism of total size and relative length of legs, but these patterns of sexual dimorphism are common to practically all groups of spiders, even to the other suborders.

When the characters of Titanocidae are further compared with those of other families of Amaurobioidea, the same fundamental differences as are listed in Table 43 generally exist. A few exceptions are listed below, but all of them can be explained by convergent evolution as regards the single character mentioned.

Titanocidae and Amaurobiidae: Phyxelidinae share the strong modification of the anterior legs in males and the absence of tarsal trichobothria. As regards all other characters listed in Table 16,

Phyxelidine spiders have the unmodified basic pattern of Amaurobioidea.

The embolus of most representatives of Amaurobioidea is a thin coil as in Titanocidae, but this coil is rarely transversally apical, and usually embraces the tegulum longitudinally.

There is sexual dimorphism in the chelicerae of several Dictynid species, although never the same type of modification as in *Titanoeca*.

The fovea of *Argyroneta* is also an insignificant depression, and the vulval ducts have an internal spiral in *Dictyna*.

The calamistrum of Titanocidae is similar to corresponding structures in most Cribellate Amaurobioidea, but this is the simplest type of calamistrum, which is found also, e.g., in Eresidae, Thaididae, and Hickmaniidae.

When the characters of Titanocidae are

compared with those of superfamilies other than Amaurobioidea, there are resemblances to Zodarioidea, Sparassoidea, and even Salticoidea, but the possible presence of a complicated adaptive pattern or parallel evolutionary trends impedes the final placing of this family. Here it is provisionally listed as a single derivative of the Amaurobioidean stock.

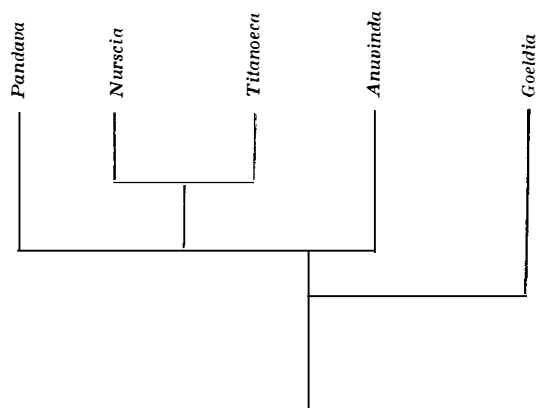


Fig. 12. Suggested phylogeny of Titanoecid genera.

The mutual relations of Titanoecid genera seem to be as shown in Fig. 12. This cladogram is principally constructed according to the genital characters, leg spinulation, and abdominal pattern, because other characters are less variable within this family, or because there is an unlimited possibility of parallelism in them.

Goeldia is by far the most deviating genus, and probably also has the most primitive characters, at least as regards sexual dimorphism. On the other hand, the epigyne of *Anuvinda* is of strikingly similar type.

The European species, except *Nurscia albosignata*, have generally been listed under *Titanoeca*. When all are critically compared it is obvious that the limitation of these two genera must be considerably altered. *N. albosignata* shares with the *albomaculata* group of *Titanoeca* auct. all characters except the excessively lengthened basal segments of the male palp. This single character may well be due to some rather insignificant genetic change.

There is considerable infraspecific variation, including both geographic variation and heterogeneity of populations investigated, in several diagnostic characters of the European Tita-

noecids analyzed by myself in detail. Cf. also HOLM (1950, p. 134).

The most important characters of Titanoecid genera have been presented in Table 44.

Psechridae

The limitation of Psechridae by most recent authors is an excellent instance of trust in authority. Since DALMAS (1917) assigned Stiphidiinae and Matachiinae to Psechridae, these groups have been listed there, although several authors (PETRUNKEVITCH 1928 and 1933, BRISTOWE 1938, etc.) have stated that they do not conform to the original definition of Psechridae. PETRUNKEVITCH (1928, p. 19) first defines Psechridae: »Tarsi with clawtufts and a single row of trichobothria. Scopulae wanting. . . . Family Psechridae . . . Page 37» There he writes: »Family Psechridae. Key to subfamilies. 1. Claw tufts present. Tarsi with scopula. Cribellum divided . . . 1 Sub-Family Psechrinae. Clawtufts wanting 2. Cribellum divided . . . 2 Sub-family Stiphidiinae. Cribellum entire . . . 3 Sub-Family Matachiinae».

The position of DALMAS' Stiphidiinae and Matachiinae is discussed on p. 322 and 309. The family Psechridae is here limited to consist of two genera of large spiders, *Psechrus* and *Fecenia*, that are found in the Oriental region and adjacent parts of the Palearctic and Australian regions.

The basic pattern of this family can be described as follows:

Carapace pear-shaped, eyes in two recurved rows, fovea large and longitudinal, clypeus high. Sternum with more or less distinct marginal elevations. Labium free, distally notched. Maxillae long, with strong median scopula. Chelicerae with strong teeth on both margins of the fang groove, fang with smooth basal part.

Abdomen long, more or less cylindrical, with distinct dorsal and ventral pattern. Cribellum bipartite, as wide as the area of spinnerets. Anterior spinnerets very large, conical; posterior spinnerets cylindrical and with a short apical segment. Median spinnerets exceptionally long and slender. Tracheal stigma close to cribellum.

Legs long, strongly spinulated on femora, tibiae, and metatarsi. In males, the first leg enormously lengthened and its tarsi and metatarsi covered with long, erect hairs. Tarsal trichobothria very indistinct, but usually there are some of equal length. Tarsi with three toothed claws and rather well-developed claw-tufts composed of longitudinally arranged coarse hairs. Ventral hairs of tarsi usually more densely spaced than elsewhere, but no true scopulae comparable to these structures in, e.g., Ctenidae and Theraphosidae exist.

Calamistrum very characteristic, consisting of 3–5 regular rows of true calamistral hairs.

Table 45. Psechridae.

	<i>Fecenia</i>	<i>Psechrus</i>
Figure	472, 473	474 – 476
Size	large	very large
Cribellum	very large, bipartite	large bipartite
Dorsal abdominal pattern	anterior folium + transversal bars	anterior folium + transversal bars
Ventral abdominal pattern	a pair of large oval white patches	narrow light central stripe
Size of AM	> PM	< PM
Shape of MOT	anteriorly wide trapezium	long $\pm$ quadrangular
Cheliceral teeth	3 – 4 + 2 – 4	4 + 3
Fovea	indistinct	short, very deep
Clypeus	centrally weakly projected	very high, with white hairs
Labium	long notched	long notched
Apex of sternum	rounded	shortly pointed (sternum with white patches)
Tibial & metat. ventr. spines	1 + 3	4 – 5 + 3 (rather irregular)
Tarsal trichobothria	1 row of almost equal length	some indistinct
Femoral spines	none	numerous dorsal
Calamistrum	3 rows	3 – 5 rows
Trochanterae	weakly rebordered	strongly rebordered
Cymbium	with apical scopula	long and narrow, with dorsal scopula
Tibial processes	lateral carina	ventral boss with dense tufts of bristles
Patellar processes	strong ventral	none
Origination of embolus	basal	apical
Shape of embolus	thin circular	very variable, but $\pm$ straight
Secondary conductor	long membranous arch	membranous lamella – complicated sclerite
Median apophysis	central, large and protruding	absent
Tegular apophysis	acute basal	none (tegulum oval)
Epigynal pit	anterior, variable in shape	none
Epigynal plate	posterior, variable in shape	large $\pm$ quadrangular
Lateral lobes	distinctly separated	anteriorly fused to epigynal plate
Special characters	claw tufts present; I legs very long in σ ; sternum with lateral elevations	palpal femora modified; all the legs very long
Distribution	Oriental – Australian	Oriental – Australian – SE. Palearctic

Epigynal area well chitinated, divided by longitudinal furrows into a central septum and lateral lobes, but the septum is seldom (*Fecenia*) distinctly limited anteriorly.

Male palpus robust. Femora, patella, and tibia may have simple processes or elevations, but no complicated apophyses. Bulbal organs highly variable, even concerning the presence of sclerites.

Psechrids spin a large sheet web and live on its lower surface, not on the upper surface as do the Agelenids.

In *Fecenia*, the palpal organs strikingly resemble those of the Ecribellate Eresid genus *Wajane* with its circular tegulum, coiled embolus, and large, outstanding «median apophysis». The functional conductor of *Fecenia* superficially resembles the secondary conductor of Amaurobiidae, but the site of insertion is much more central.

The position of Psechridae is enigmatic. Although most authors have regarded it as a close relative of Agelenidae (PETRUNKEVITCH 1923, 1933) or Amaurobiidae (LAMEERE 1931, BERLAND 1932, BRISTOWE 1938), it is evidently not a member of Amaurobioidea.

The general appearance and the male genital

organs of *Psechrus* are strikingly similar to those of *Hickmania*, while the colour pattern and sexual dimorphism refer to Zodariides. The structure of the cribellum and spinnerets proper most closely corresponds to the structure of these characters in Titanocidae. Our knowledge of the anatomy of Psechrids is slight, but perhaps additional data of this kind may throw some light on the evolution of Psechridae. It is provisionally listed here as a derivative of Amaurobioidea.

The most important distinctive features of the two Psechrid genera are listed in Table 45.

Toxopidae and Anyphaenidae

The limitation of Toxopidae has been discussed on p. 292. *Toxops* has some characters, such as the eye pattern, which are peculiar to this small group, but the genital structure shows affinity with Hahnidae. If this is phylogenetic, Toxopidae could be included in Amaurobioidea, but here it is left as an isolated group that certainly belongs to Amaurobiides.

The mainly Neotropical family Anyphaenidae needs a thorough revision, and, as limited now, its monophyly is by no means certain. The direct affiliation of the type genus, *Anyphaena*, to Amaurobioidean Ecribellate derivatives is unambiguous. The lack of a secondary conductor is obviously primary, and any of the Anyphaenid species investigated by myself shares this character. *Anyphaena* might be related to Sparassidae and Clubionidae s. str., but another place in Amaurobiidae is possible.

Sparassoidea

SIMON (1897) included both Clubioninae and Sparassinae as subfamilies in his Clubionidae, but Sparassidae has since generally been listed as a family of its own. The other laterigrade subfamily, Selenopinae, has often been included in Sparassidae, but here it is confidently transferred to the superfamily Lycosoidea.

The large family Sparassidae is characterized by strong reduction of the colulus. No representative of the well-known subfamilies Sparassinae, Sparianthinae, Micrommatinae, Heteropodinae, Palystinae, Clastinae, and Staioninae investigated by myself, has a visible homologue of the colulus, an occurrence that is quite rare in Araneomorpha. On the other hand, there is a well defined colulus in *Chrosioderma albidum* Sim. 1897, and most probably this genus should be transferred outside Sparassidae, while the position of the other genera of Chrosiodermatinae is unknown to me.

After the basic classification of Sparassidae by SIMON, JÄRVI (1912, 1914) made an analysis of this family according to the female genital organs, and thus Sparassidae is the only family in which the revised classification has been based on the genital characters for more than fifty years. Although I have not thoroughly investigated the natural classification of this family, the current one seems to be more correct than that of most other families that have been left unrevised here.

The genus *Clubiona* and a few related ones are the only spiders that have been left in Clubionidae: Clubioninae. Their exact position remains obscure, but the colouration and genital organs show affinities with Sparassidae. On the other hand, the «genus» *Chiracanthium*, with worldwide distribution, is possibly a relative of this group also, but not necessarily worthy of

common familial affiliation (cf. WAGNER 1888). See also p. 290.

Gnaphosoidea

The limitation of this superfamily is not clear, but the classical families of Gnaphosidae and Platoridae seem to be related to each other, and Prodidomidae probably is also a member of this group. On the other hand, the current limitation of Gnaphosidae is also open to doubt, and even the mutual limitation of Gnaphosidae and Platoridae is rather a matter of opinion. The following notes only are presented here, without any attempt to decide the final placing of these families.

The classical key character for Gnaphosidae, the presence of widely separated, cylindrical anterior median spinnerets, is not suitable for this purpose. First, the subfamily Micariinae including, e.g., the Holarctic genera *Micaria*, *Micariolepis*, *Phrurolithus*, *Phrurolimpus*, *Phruconellus*, *Phonotimpus*, *Piabuna*, and *Laudetia*, must be transferred to Gnaphosidae because of the fundamentally similar pattern of male and female genital organs, eyes, abdominal colouration, shape of maxillae, sternum, and labium, etc. In fact, JACKSON (1932) and LOCKET & MILLIDGE (1951) have proposed the removal of *Micaria* from Clubionidae to Gnaphosidae, while *Phrurolithus* and related genera have always been listed in Clubionidae since SIMON (1897). The structure of the spinnerets in these genera is, indeed, similar to that of most of the Clubionids, as that family has generally been limited. At the same time, their spinnerets are exactly like those in all the Araneomorph families that have not undergone specialization of this structure. The subfamily Micariinae deviates from all other Gnaphosids examined by myself, in having both feathery and lanceolate hairs.

Secondly, cylindrical anterior spinnerets are also present in various modifications in all the genera that are here included in Prodidomidae (cf. p. 291). In my opinion, the Gnaphosid subfamily Anagraphinae probably belongs to the vicinity of Prodidomidae, and if Gnaphosidae and Prodidomidae are not related to each other, the familial affiliation of Anagraphinae must be re-estimated. However, a phylogenetic relationship of the families mentioned above is possible.

The structure of the genital organs of Gnaphosidae is useful in placing this group. The median apophysis is usually well developed and its variation in shape corresponds to that of Amaurobioidea. The male palpus of Anagraphinae is fundamentally dissimilar, and there is no median apophysis, but the cymbial margin has a paracymbium. The homology of this structure with the correspondingly named part in Araneoidea is doubtful. In any case, the general appearance of *Theuma* and related Anagraphine genera is strikingly similar to that of typical Gnaphosids. In this case, adaptation to the same ecological environment may have produced several externally similar types with largely different phylogeny.

Platoridae is usually characterized by a distinctly flattened body and an exceptionally wide sternum. In my opinion, the genera *Plator*, *Doliomalus*, and *Vectius* could as well represent extreme results of a general trend in this group, without having any close relationship to each other. This hypothesis is supported by the fact that all the intermediate phases of these key characters occur in the groups Hemicloinae and Trochanteriidae. If the family Platoridae ought to be preserved, Hemicloinae could better be included there as a subfamily, while Trochanteriidae is probably a synonym of the former.

The trend towards longitudinally modified median spinnerets in Gnaphosidae is also worth mentioning here, as it has produced externally similar structures such as the median spinnerets of the Eresid genera *Dresserus* and *Gandanameno* (cf. p. 387 and Fig. 453). KISHIDA (1930) proposed the family Cladothelidae for such Gnaphosid relatives, but he was not aware of the fact that these structures are present also in all species of *Zelotes* and *Rhaeboctesis*, at least, as well as in all Platorid species.

6. Zodariides

For most Araneomorph spiders outside the well-defined groups Amaurobioidea and Araneidae, the name Zodariides was proposed on p. 288. The limitation of this group remains rather vague, and it is not entirely out of question that it might include several polyphyletic groups. For the prevailing evolutionary trends within this supposed group, see Table 1. Probable affinities of some minor groups of Zodariides have also been discussed elsewhere in this paper.

The provisional members of the branch Zodariides are summarized below. They are divided into three groups, but the phylogenetic relationships within the groups cannot be analyzed here.

A. Eresidae

The presence of numerous adaptive characters is the reason why the correct limitation of Eresidae has been known since SIMON (1903 a, p. 978). Before that it had been confused with Salticidae or Palpimanidae, seemingly on account of the widened cephalic area.

SIMON divided Eresidae into two subfamilies, Eresinae and Penestominae, and this practice has been accepted by all later authors. Here a new Ecribellate genus, *Wajane*, is assigned to Penestominae. This group could probably be separated as an independent family, but as only a single, seriously defective female specimen of *Penestomus* and a single male of *Wajane* have been available for examination, no radical changes have been made here.

Both subfamilies are concentrated in the Ethiopian region, but Eresinae is also represented in the Oriental and in the Mediterranean regions, and a single species, *Eresus cinnaberinus*, even occurs over large areas of the Palearctic.

There is a basic pattern of characters that is valid for most of the species, and these characters are listed below. However, it is to be emphasized here that such a pattern does not generally refer to key characters, but rather to evolutionary trends.

The carapace is a rounded rectangle. The fovea varies greatly in depth, even in the different sexes of the same species, but when present, it is more or less circular. The clypeus is always centrally protruding, the median eyes are close to each other, while both pairs of lateral eyes are far apart from them, constituting the «lateral ocular trapezium» that usually reaches more than half-way along the quadrangular cephalic area.

The sternum is separated from the labium by a distinct seam, and the anterior part of the sternum is always narrowed. The labium is apically rounded. The maxillae are lateroapically rounded and furnished with a well developed serrula. The chelicerae are strong, the anterior margin of the cheliceral groove is armed with a strong chitinous keel, which may be serrate, but the posterior margin is always unarmed. The cheli-

Table 46. Eresidae: subfamilies.

	Eresinae	Penestominae
Size	♀ very large – medium, ♂ large – small	♂ ♀ medium
Cribellum	2 (– 3) – 4-partite	bipartite or reduced
Anterior spinnerets	strongly conical	cylindrical – weakly conical
Posterior spinnerets	quite variable in size and shape	cylindrical
Median spinnerets	variable (sometimes transversally divided)	small triangular
Shape of carapace	cephalic area usually ± raised	flat
Fovea	deep pit – absent	insignificant depression
Shape of MOT	trapezoidal	very strongly trapezoidal
Relative width of LOT	1 – 3 times the length	> 3 times the length
Cheliceral keel	± protruding triangular	serrate, triangular
Leg spinulation	♂ abundant ± irregular, ♀ strongly reduced	♂♀ moderate, very irregular in tibiae
Tarsal and metatarsal scopulae	dense – weak	practically absent
Calamistrum	long	short – reduced
♂ palpal tibial processes	absent	1 large branched
Embolus	thin spiral	thin semicircular
Conductor	± spiral lamina, apex often modified	semicircular folded lamina
Median apophysis	absent (<i>Megunia</i> : analog. structure present)	large and protruding
Epigynal structure	usually median septum + lateral foveae	protruding central plate
Special characters	legs very thick; tarsi and metatarsi constitute a functional unit; sexual dimorphism striking in several characters	position of AL exceptionally central
Distribution	Ethiopian – Oriental – S. & C. Palearctic – Malagasy	S. Ethiopian

ceral fang is distinctly geniculate, and usually rather short. The basal part of the fang is smooth, while the apical part is distinctly furrowed longitudinally.

The abdomen is rounded oval, often flattened, never covered by chitinous scuta. The anterior pair of spinnerets are thick and conical, and usually close to each other, while the posterior pair are more or less distinctly flattened. The apical segment of both these pairs of spinnerets is short, never exceeding the length of the basal one. The median spinnerets are rather well developed and liable to bizarre modifications. The cribellum is well developed, and always distinctly of paired origin. The cribellar plates are often oval, and they may be separated from each other by a wide septum, especially in males. The tracheal stigma is close to the spinnerets.

The epigyne is usually simple, with a median septum and laterocaudal pair of foveae. The vulval structure is also simple.

The legs are short and stout, and the tarsi are usually united to the metatarsi by a practically rigid joint. There are no distinct trichobothria on the tarsi, but a long subapical one on the metatarsi and a few indistinct basal

trichobothria on both metatarsi and on tibiae. The hair covering of the legs is usually dense, but the strength of the ventral scopulae is quite variable, depending on the habitat.

The basic spine pattern is unique among the Araneomorph spiders. It consists of an apical ventral pair on the tibiae and irregular ventral spines on the metatarsi and tarsi. However, the first pair of legs may be spineless. There are always three tarsal claws, and the paired claws are densely toothed. Underneath the unpaired claw there is a sheath composed of a dense row of short superficial hairs, and below the paired claws there is a pair of strong setae acting as auxiliary claws.

The calamistrum is long, usually stretching along the whole length of IV metatarsi and dorsally followed by a dense, hairy zone.

The male palpus is short and thick, rather simple. The patella and tibia are unarmed in all known Cribellate representatives of Eresidae, and the cymbium has no processes. The bulbus is attached subbasally to the alveolus, and the subtegulum is often seen basally below the more or less cylindrical-globular tegulum. The embolus is always a spiral spine, while the conductor constitutes a folded spiral lamella

around the embolus. The apical part of the conductor is often modified, but only seldom distinctly divided into two separate sclerites.

There is usually very distinct sexual dimorphism in the shape of the cephalic area, relative size of eyes, shape of chelicerae, strength and modifications of the first leg, shape of cribellum, abdominal pattern, spine pattern, and especially in size.

The basic type of Eresids live among vegetation and spin large webs there. Some of them are famous for their social life. However, there is a general trend towards adaptation to burrowing habits, and some of them build elaborate subterranean nests with characteristic doors. The Eresine genera fall into four distinctly related pairs, and even the phylogenetic relationship of these pairs with each other can be derived from the known characters. A simplified cladogram of the whole family is presented in Fig. 13.

Stegodyphus and *Magunia* obviously represent the basic type of Eresidae better than any other genus, and they have none of the typical adaptive characters of the more advanced genera. However, the male palpus of *Magunia* shows advanced features, e.g., the development of an additional bulbal sclerite by fission of the conductor. The abdominal pattern of these two genera is almost identical with that of Ammoxenidae. It may be due to adaptation to desert circumstances, but numerous other characters of Eresidae and Ammoxenidae also show the possibility of a phyletic relationship of these families (chelicerae, labium, maxillae, spine pattern, and genital organs).

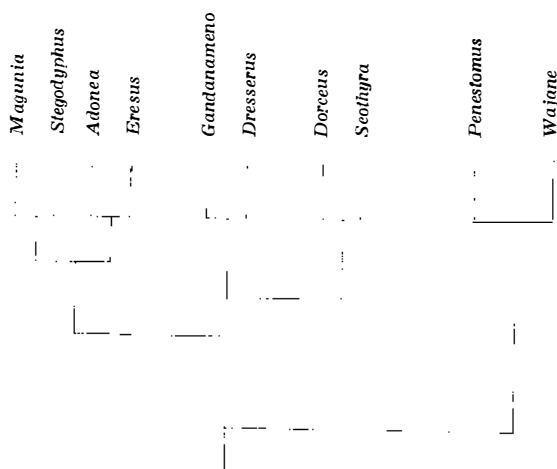


Fig. 13. Suggested phylogeny of the Eresid genera.

On account of the generotype of *Adonea* only, this genus could be placed close to *Stegodyphus* and *Magunia*, especially because of the similarity of the whole cephalothorax, including also the lack of distinct fovea. The latter character is exceptionally variable in *Adonea*, and altogether the mutual relationship of the species of this genus is less marked than in any other Eresid genus. Probably *Eresus* constitutes a specialized branch of the evolution of *Adonea*. By some standards, the four genera discussed above could be regarded as constituting a separate subfamily, but, in my opinion, excessive splitting of highly adaptive groups must be avoided.

Although the species that are here included in the new genus *Gandanameno* have previously been listed in *Eresus*, the phylogenetic relationship of *Gandanameno* and *Dresserus* is undoubted. Both have a more or less similar flattened appearance, almost identical eye patterns, and male and female genital organs. Further they share a peculiar modification of the median spinnerets: there is a deep transversal furrow, and when they are viewed superficially only, the impression of two different pairs of spinnerets in their place is difficult to avoid. This trend towards fission in the pattern of spinnerets is further expressed in the cribellum of *Dresserus*, in which both plates have a secondary septum. The latter genus seems to be one of the most advanced in Eresidae, and it is further separated from *Gandanameno*, e.g., by the peculiar anterior horns of the male carapace.

The pair *Seothyra* and *Dorceus* share another type of modification of the spinneret pattern, characterized by the reduction of the posterior pair. A similar trend also prevails in Zodarioidea, although PETRUNKEVITCH (1933, p. 320) supposed that the order of reduction was always the same as in the well-known pattern of reduction in Theraphosomorpha.

Nothing is known about the habits of *Dorceus*, while the complicated subterranean tubes of *Seothyra* have been described in detail by PURCELL (1903).

As mentioned above, the representatives of Penestominae are not well known, but the presence of tibial apophyses and a large «median apophysis» in *Wajane* is worth mentioning here. The transversal colulus of this genus is easily derived from the usual type of Eresid cribellum, and it is possible that the female of this species might have a functional cribellum. The cheliceral groove of both *Penestomus* and *Wajane*

	<i>Stegodyphus</i>	<i>Magunia</i>	<i>Adonea</i>	<i>Eresus</i>
Figure	454	450, 456, 460	445, 449, 457, 459	467
Size ♀	large – very large	very large – medium	large – very large	very large
♂	medium	medium – small	medium – large	large – medium
Cribellum	bipartite, long oval	bipartite, long oval	bipartite, long oval	bipartite: ♂ oval, ♀ semicirc
Anterior spinnerets	strongly conical	strongly conical	strongly conical	strongly conical
Posterior spinnerets	< AS, flattened	≤ AS, triangular – flatten.	< AS, flattened	< AS, flattened
Median spinnerets	flattened	flattened	flattened, large	partly longitudinally divided
Abdominal pattern ♀	dark longitudinal bands	none (yellow) – dark bands	spotted	brown folium or scutum
Abdominal pattern ♂	dark margins + narrow light band	none – <i>Stegodyphus</i> -type	very variable	oval brightly coloured folium + 4 circular spots
Modifications of cephalic area	gradually raised	gradually raised	♂ ± abruptly raised – flat	moderately raised
Clypeal triangle	separate acute sclerite	separate acute sclerite	♀ gradually raised – flat	separate obtuse plate
Fovea	none – shallow depression	none	± acute, variable	♂ deep circular pit,
Size of AM	0.5 – 1 PM	subequal to PM	♂ rounded depression, ♀ none	♀ large depression
Shape of MOT	trapezoidal	± quadrangular	0.25 – 0.5 PM	0.25 – 0.5 PM
Shape of LOT + width/length	reverse trapezoidal, 1 – 1.5	rectangular – trapezoidal, 1.5 – 2.75	wide trapezoidal	very wide trapezoidal
Cheliceral keel	large triangle	very large triangle	rectangular – reverse trapezoidal, 1 – 1.5	reverse trapezoidal, 1 – 1.5
Anterior part of sternum	♂ shortly narrow, ♀ unmodified	♂ ♀ slightly narrowed	variable triangle (– serrate)	large triangle
♂ I legs	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed + anterior auricles
Sex. dimorphism in leg spinulation	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Tib., met. & t. v. sp. (♂)	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Tarsal scopulae	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Cymbium	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Relative size and shape of embolus	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Conductor	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Shape of tegulum	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Epigynal septum	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Epigynal pit (– foveae)	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Special characters	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Environment	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed
Distribution	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed	♂ ♀ gradually narrowed

deviates from the basic Eresid type, and there are actually two rows of teeth, although the inner row is not situated on the posterior margin of the cheliceral groove but rather represents an additional row on the anterior margin.

The relation of Eresidae to the Ecribellates remains obscure. Most probably, there are no close relatives of Eresidae among the recent spiders, except possibly Ammoxenidae.

B. *Zodarioidea*

This group is characterized by a trend towards the reduction of the posterior (and

even median) pair of spinnerets, sclerotization of the abdomen, and simplification of the female external genitalia. The colour pattern of the abdomen is composed of well defined light spots, while the cephalothorax is usually unicoloured, and sometimes modified in shape or rugose. The trichobothrial pattern is often simple and usually totally lacking in tarsi, while the leg spinulation is less constant than in Amaurobiidae and Araneidae. The basic two-row eye pattern may be thoroughly modified, and the clypeus especially is quite variable in height. The colulus is well-chitinized and unpaired when present, but the strong modification of the spinneret pattern may have caused the

dae: Eresinae.

<i>Dresserus</i>	<i>Gandanameno</i>	<i>Dorceus</i>	<i>Seothyra</i>
447, 453, 465 – 466	446, 461, 463	464, 468	448, 451, 458, 462
large – very large medium – large	large – very large medium – large	large medium – large	medium – large medium
(3 –) 4-partite strongly conical > AS, cylindrical transversally bipartite none	bipartite strongly conical ≥ AS, cylindrical transversally bipartite none	bipartite (equil. triangles) cylindrical, widely spaced very short, flattened flattened none	bipartite (wide oval) cylindrical, widely spaced very short, flattened flattened obscure folium – none
obscure	none	variable with white areas	large yellow folium
♂ three distinct ant. horns, ♀ flat	♂ ♀ flat – weakly raised	abruptly raised	gradually raised, caudally rounded
widely triangular process circular pit	widely triangular process circular pit – depression	separate acute sclerite deep circular pit	very shortly pointed circular pit (♂) – depression (?)
0.25 – 0.5 PM	0.25 – 0.5 PM	≥ PM	≥ PM
very wide trapezoidal rectang. – trapez., 1.75 – 2.5	wide trapezoidal ± rectangular, 2 – 3	very wide trapezoidal reverse trapez., 1 – 1.5	wide trapezoidal (– very wide) rectangular, 1.25
large triangle	large triangle	strong boss with distal horn	obliquely triangular, serrate
♂ ♀ gradually narrowed	♂ ♀ weakly narrowed	abruptly narrowed	gradually narrowed
moderately thickened distinct (♀ no spines)	unmodified absent (? ♂ with less sp.)	moderately thickened distinct (except leg IV)	very long and strong distinct (except leg IV)
II – IV: 0 – 3 + 1 – 2 + numerous	III – IV: 1 + 2 + a few – none	I – IV: numerous in all segments	II – IV: tib. & mt: variable, t: numerous
moderately developed	moderate – weak	weak	weak
oval	subcircular	oval – apex long	apex long
large circular (1 ½ coils)	large circular (1 ½ coils)	moderate circle	moderate circle
horn-shaped spiral	double falx	screwed, apex ± modified	screwed, apex ± modified
disc-shaped	disc-shaped	globular	globular
very wide variable foveae	wide ± circular foveae	absent (caudal triang. plate) trapezoidal	caudal trapezium long with anterior dilatation
throughout flattened	cephalothorax and basal parts of legs with short spinules (in large species)	apex of conductor often strongly branched	♂ chelicerae geniculate at least
terrestrial	? (subterranean – terrestrial)	? (subterranean)	subterranean
Ethiopian	S. Ethiopian	S. Mediterranean – C. Ethiopian	S. Ethiopian

reduction of the colulus in some groups of Zodariides.

The following subfamilies and families probably belong to Zodarioidea: Ammoxenidae, Bradystichidae, Cithaeronidae, Corinnidae, Cryptothelidae, Cybaeodinae, Cydrelinae, Hermippellinae, Hermippinae, Huttoniinae, Mecysmaucheninae, Nicodaminae, Palpimanidae, Plectophaninae, Stenochilidae, Stenomorphinae, and Zodariinae.

Altogether, the groups here included in Zoderiides constitute a much more heterogeneous assemblage than does Amaurobiides, both in regard to general appearance and the evolution of single characters.

Most of the Ecribellate groups above are small and their geographical range is very limited, too. An exception exists in Corinnidae, which is both world-wide and rich in species. Many of these have generally been known as representatives of the «Clubionid» subfamily Corinninae, but a large number of genera will be transferred from other families as they are listed by ROEWER (1942 – 1954) and BONNET (1945 – 1961).

Another group, Zoderiinae, is often limited as a large world-wide subfamily. In my opinion, this group is distinctly polyphyletic, and probably some of its three-clawed genera are most closely related to Corinnidae. These are, e.g., most of the Neotropical genera originally as-

Table 48. Eresidae: Penestominae.

	<i>Penestomus</i>	<i>Wajane</i>
Figure	452, 469	470, 471
Size	medium	medium
Cribellum – colulus	er: bipartite, long oval	co: transversal narrow plate
Anterior spinnerets	strongly conical	slender, slightly conical
Posterior spinnerets	< AS, cylindrical	~ AS, slender cylindrical
Median spinnerets	small triangular	small triangular
Abdominal pattern ♂	unknown	2 central white patches
Abdominal pattern ♀	none	unknown
Shape of carapace	very flat subrectangular	very flat subrectangular
Clypeal triangle	gradually pointed	obtuse
Fovea	oval shallow depression	indistinct
Size of AM	subequal to PM	subequal to PM
Shape of MOT	strongly trapezoidal	strongly trapezoidal
Shape of LOT	very strongly trapezoidal	strongly trapezoidal
Cheliceral keel	rounded triangular with 3 teeth	rounded triangular with 4 teeth
Anterior part of sternum	gradually narrowed	gradually narrowed
Tib. & met. v. sp.	I–II: 0 + 2, III–IV: 1 – 3 + 2	I–IV: numerous irregular + 3
Tarsal spines	none	I–IV: 2 – 3 rather long apical
Tarsal scopulae	none	none
Shape of cymbium	♂ unknown	circular with basodorsal carina
Tibial apophysis		long branched
Embolus		semicircular, distally modified
Conductor		semicircular fold
Median apophysis		very long and protruding, geniculate
Shape of tegulum		disc-shaped
Epigynal plate	caudally projected trapezium	♀ unknown
Epigynal foveae	paired longitudinal narrow	
Distribution	S. Ethiopian	S. Ethiopian

signed to Agelenidae, but recently transferred to Zodariidae by ROTH (1965): *Cybaeodamus*, *Cyrioctea*, *Ishania*, *Valcheta*; or originally described in Zodariidae: *Glieschiella*, *Moenchausianna*, etc. The genus *Mevianops* is here transferred to this group, too.

If this presupposition is correct, the group Zodariinae is Palearctic – Ethiopian – Oriental, as the various species described under the generic name *Storena* also seem to belong elsewhere.

Some notes on the family Prodidomidae may be given here. Although it has been revised twice (DALMAS 1919 and COOKE 1964), these authors have hardly been well acquainted with those «Clubionid» genera that are here transferred to Prodidomidae as the subfamily Myandrinae. I have personally investigated material of *Honunius quadricauda*, *Molycria mammosa*, and *Myandra bicincta*, and they certainly seem to belong to Prodidomidae, although their chelicerae are less specialized than those of, for instance, *Prodidomus* and *Zimirina*. Most probably *Cryptoerithus* is a close relative of the Myandrine genera mentioned above (cf. DALMAS 1919, p. 281 and COOKE 1964, p. 261). On the other hand, the genus *Sphingius* is a typical re-

presentative of Corinnidae, although it has been listed in Micariinae: Molycriae by ROEWER (1954 a).

COOKE (*op. cit.*) could not place Prodidomidae in a phylogenetic classification of spiders, nor is it possible to do so here. Although many of its characters refer to group Zodarioidea, the basic spinneret pattern is largely comparable to that of Gnaphosidae and Platoridae, and the genital organs could be interpreted as having the basic pattern of both Gnaphosidae and Corinnidae.

C. Salticoidea

The jumping spiders, or families Salticidae and Lyssomanidae, constitute one of the most easily limited groups in the whole order, but the placing of this group in a phylogenetic classification remains somewhat uncertain. They have generally been listed at the end of the spider system because of their numerous advanced characters. In fact, the extreme types are adapted to their unique environment, which is devoid of all other spiders. As in the case of the water-spider, their adaptive radiation has been exceptionally abrupt, and the predominance of adaptive characters has thoroughly

Table 49. Uloboridae: subfamilies.

	Uloborinae	Tangaroinae (<i>Tangaroa</i>)	Hyptiotinae	Miagrammopinae
Size	minute – large	medium	medium – small	medium – large
Cribellum	large undivided	large undivided	large undivided	large undivided
Shape of abdomen ♂	cylindrical – oval	cylindrical	oval	long cylindrical
Shape of abdomen ♀	often gibbous	cylindrical	variably modified (also gibbous)	modified cylindrical
Abdominal tubercles	dorsal and caudoventral	absent	dorsal or caudal	caudodorsal or absent
Shape of carapace	♀: ± pear-shaped, ♂: variably modified	♂♀: pear-shaped	variable, strongly modified	pentagonal – long rectangular
Fovea	transversal depression – none	longitudinal depression	transversal or longitudinal depression	small circular depression – none
Cheliceral armature	usually 2 + 4	serrate keel + 4	1 – 2 + 0 – 2	serrate keel + 1 large
Size of AL	variable	smallest	strictly smallest	usually ± totally reduced
Size of AM	variable	subequal to PM	variable	minute – absent
Shape of MOT	usually trapezoidal	large rectangular	variably trapezoidal	strongly trapezoidal
Shape of LOT	rectangular – anteriorly widened	anteriorly widened	strongly trapezoidal	strongly trapezoidal
Shape of sternum	long oval – triangular	long oval	long triangular or modified	2 separate sternites, II–III coxae surrounded by sternal plates
Sternal margin	usually strongly notched (= undulate)	smooth	usually strongly notched	anteriorly and posteriorly excavated
Labium	semicircular	semicircular	triangular	long, distally pointed
Tib. & met. v. sp. Modifications of 1 leg in ♂	III–IV: usually 0 – 1 + 2 none	2 – 6 + 4 – 6 tibiae apically, metatarsi basally curved	0 – 1 + 1 – 4 irregular none	absent tarsi with central notch
Dorsal spinulation of 1 leg in ♂	2 – 3 rows of strong spines	complicated pattern	1 row	variable, but usually present
Femoral trichobothria I–II	retrolateral basal row	retrolateral row, basally very dense	dorsal basal row (– absent in I)	I: absent, II: basal retrolateral row
Femoral trichobothria III–IV	prolateral row; III: throughout, IV: subapic.	prolateral row	III: prolat. (+ dorsal), IV: prolat.	subapic. prolateral row
Trochanteral trichobothria	absent	absent	absent – III: present	I–II: absent, III–IV: present
Feathery hairs	absent	absent	usually abundant	usually present
Shape of cymbium	usually flat triangular	convex with lateral furrow	variably modified	small and flat, variably modified
Palpal tibia	usually very short disc-shaped	cylindrical, longer than wide	longer than wide, variably modified	± conical, cymbium inserted basally
Embolus	usually thin ± circular	longitudinally furrowed lamina	thin, variably coiled	short curved spine
Conductor	usually ± simple lamella	absent	variable, apex bi- or trifurcate	folded lamina, distally ± pointed
Median apophysis	distal, often hooked	absent	large, shape variable	with 2 distinct branches
Tegular apophysis	absent	absent	absent	T- or L-shaped
Epigynal pit	usually transversal oval	absent	paired foveae	paired foveae
Epigynal projections	paired or unpaired, caudal or anterior	none, epigynal area smoothly sclerotized	unpaired caudal plate	usually unpaired caudal
Special characters		subtegulum fused to tegulum; lateral tarsal spines in I–IV legs	tarsal spines sometimes present	cephalic area with semi-circular furrows; I & IV legs much longer than II & III
Type of web	usually complete orb (± horizontal)	?	sector of an orb	single thread or reduced orb
Distribution	world-wide in the tropical and subtropical zones	Australian	Holarctic – Neotropical (– ? Oriental)	world-wide in the tropical and subtropical zones

altered their general appearance. Nor is there in the case of jumping spiders any easily traced basic pattern of the genitalia, because those organs are fairly simple in this group. Therefore it is not certain, e.g., whether the median apophysis is primarily lacking or secondarily reduced. When all other characters available have also been taken into account, the first alternative seems to be the most probable. As to the basic

colour pattern, genital organs, cheliceral armature, and spinnerets proper, the crab spiders (Thomisidae and Aphantochilidae) are largely similar to Salticids. On the other hand, not one of the Salticid spiders examined by myself has feathery hairs, and the colulus is also fundamentally different, being sometimes even primarily bipartite in Salticids, but always entire in Thomisids.

Table 50. Ulobori

	<i>Ariston</i>	<i>Philoponella</i>	<i>Daramulunia</i>	<i>Zosis</i>
Figure	489, 492 and MUMA & GERTSCH (1964)	468 – 487, 496, 498, 500 – 501	504	482, 488, 493, 499
Size	small	small – large	medium – small	medium
Dorsal abd. tubercles	1 central – none	0 – 2 unpaired + paired caudal	1 – 2 unpaired – none	1 – 2 unpaired
Ventral tubercles	none	1 caudal	none	none
Size of eyes	AM > AL = PM > PL	AL var., AM > PM > PL	PL > PM > AL, AM variable	PM > PL > AM > AL
Shape of MOT	(wide) trapezoidal	long rectang. – ant. wide	trapezoidal	long trapezoidal
Shape of LOT	rectangular, W/L 2	anter. wide, W/L 2 – 2.5	rectangular, W/L 1.5 – 2	anter. wide, W/L 1.5 – 2
Fovea	indistinct depression	Y-shaped depression	indistinct	rhomboid depression
Cheliceral armature	?	2 + 4 unequal	chitinous keel + 4	2 + 4 unequal
Shape of ♂ carapace	wide pearshaped	disc-shaped with lat. furrows	oval	disc-shaped with lat. furrow
Shape of ♀ carapace	wide pearshaped	gradually elevated	oval	gradually elevated
V. sp. in tib. & met.	0 – 2 + 0 – 1	0 – 2 + 0 – 1	I: 2 + 0, II – IV: very weak – none	II: 2 + 0, III – IV: 2 + 2
Modification of I leg in ♂	tibia with additional lateral spines	apic. part of tibia & basal part of metatarsi with strong dorsal spines	?	apical half of tibia with dorsal spines
Femoral trichobothria	I: 0, II: 12 – 14 rl, III – IV: 9 – 12 pl	I – II: 0 – 10 rl, III – IV: 10 – 17 pl	I – II: a few rl, III: 2 – 8 pl, IV: 10 – 15 pl	I: 5 – 7 v, II: 8 – 20 rl, III – IV: 15 – 22 pl
Calamistrum	♀ > ½ mt IV, ♂ reduced	♂♀ 1/3 – 1/2 mt IV	♀ 1/3 mt IV	♂♀ 2/5 mt IV
Cymbium	triangular	triangular	♂ unrevised	flat trapezoidal with apex globular
Shape of tibia	long	short disc		subapical
Origination of embolus	central	subapical		small circle
Shape of embolus	large circular coil	small circle		membranous sec. conductor arising from subtegulum
Conductor	large lamellar	apically pointed, caudally lamellar		apical variable
Median apophysis	large subapical	apical serrate		thick cylindrical
Shape of subtegulum	basal semiglobular	thick cylindrical		± horseshoe-shaped
Shape of tegulum	disc-shaped	small variable		
Epigynal projections	anterior large hood	semicircular caudal fold	narrow central ridge	paired chitinous
Epigynal pit	transversal oval	transversal oval	long paired	caudal narrow oval
Type of web	?	transversal orb	?	transversal orb
Special characters	-		I leg extremely long and strong	legs very distinctly annulated
Distribution	N. Neotropical – S. Nearctic	Cosmotropical	Australian (Polynesia)	Cosmotropical – E. Palearctic

Salticidae is the largest family of spiders, and elaborate subdivisions have been suggested for it. See, for instance, ROEWER (1954 a). The number of cheliceral teeth has been regarded as the only primary basis for subdivision in all these classifications. As in any other family of spiders, this has led to artificial systems, and they cannot be accepted here.

D. Thomisoidea

The families Thomisidae and Aphantochilidae constitute a natural group of two-clawed spiders with some general trends peculiar to them. Such trends mostly concern the modification of both cephalothorax and abdomen, and especially the structure of the ocular area. All representatives of these families are more or

less laterigrade, and they do not spin any web, except the simple drag-line.

As mentioned above, the genital organs of Thomisids resemble those of Salticidae, but the possibility of convergence must be remembered because of the rather simple structure. On the other hand, all affinities with other laterigrade spiders, suggested in the past as well as in recent times, are easily explained through convergence.

Two wide-spread subfamilies of Thomisidae, Misumeninae (= Xysticinae) and Philodrominae, have often been treated as families. This opinion has also been supported by their different numbers of chromosomes (HACKMAN 1948). However, only a few species of Thomisids have been investigated with regard to this character, and I am inclined to unite these groups to constitute the large natural group Thomisidae until

dae: Uloborinae.

<i>Uloborus</i>	<i>Purumitra</i>	<i>Polenecia</i>	<i>Astavakra</i>
483; WIEHLE (1953)	494	481, 490, 503	480, 497
small - large	minute	small - medium	small
paired (+ caud. unpaired) 1 caudal - none	none none	1 long caudal none	all paired none
AM variable > AL, PM = PL > AL long trapezoidal rectang. W/L 1.25 - 1.5 circular depression 2 + 4 unequal gradually elevated gradually elevated III - IV: 1 - 2 + 1	AM > PM > PL > AL trapezoidal anteriorly wide, W/L 1.5 none 1 large + 3 gradually elevated, no snout ? III - IV: 2 + 2	PM = PL > AM AL trapezoidal rectang. W/L 1-1.25 oval depression 2 + 1 wide pear-shaped wide pear-shaped IV: apic. pair + 4 unpaired	AM > PM $\cong$ PL > AL long trapezoidal anter. wide, W/L 1.5 transv. oval depression serrate keels (2 + 3) ? long pear - shaped none
I - II tib. with 2 rows of strong dorsal spines	tibia with short prolat. spines	no modifications	?
basal row (4 - 5)	I - III: 3 basal, IV: 2	I - II: 1 basal, III: short basal row (4) ♀ 4/5 mt IV, ♂ 3/4	II: 5 basal, III: 4 basal
♂♀ ½ mt IV	♂ reduced		3/5 of IV mt
triangular short disc subapical large circle caudally lamellar, apically pointed apical hooked thick cylindrical small rounded	small flat semicircular short cylindr. + ventr. bristle basal rather short spine narrow membrane on subtegulum apical excavation with hook flat disc enormous oval	oval with narrow tip as long as wide central large coil caudally lamellar, apically pointed apical, hooked basal, semiglobular distal, semiglobular	♂ unknown
paired soft triangular indistinct	♀ unknown	unpaired semicircular none	central thin unpaired narrow caudal
complete transversal orb	?	reduced orb	?
I tibiae with long ventral hairs	femora with a row of prolateral spines and very long dorsal; carapace with distinct longit. bands; no ventral bristles on IV tarsi and MT; sternum without lateral notches; tarsal index I: 2, IV: 1.2 palpal pa- tella with strong dorsal seta.	apical segm. of posterior spinnerets short conical	abd. ± white; max. very wide; labium triangular tarsal index I: 2, IV: 1.2
Cosmopolitan	Oriental (Philippine Islands)	Western Mediterranean	Oriental

an indubitable subdivision into monophyletic groups can be proposed.

7. Araneides

When the Cribellate family Uloboridae is excluded, the representatives of this main branch of spider evolution constitute the most easily limited group of Araneomorpha.

A. Uloboridae

The well-known cosmopolitan species of Uloborids were generally grouped together with other orb-weaving spiders until the separation of Cribellata and Ecribellata. SIMON (1892 a) included Dinopidae in his Uloboridae, and since then the supporters of independent evolution

of Cribellata have usually listed Uloboridae close to Dictynidae or Dinopidae. However, affinities with Araneidae have been repeatedly emphasized by other authors, e.g., PETRUNKEVITCH (1923, 1933).

The analysis carried out by myself confirms the relationship between Uloboridae and Araneidae, although these two families must be placed in different superfamilies. Thus Araneidae is more closely related to several families with other kinds of web than to the orb-weaving Uloborids. This is argued as follows.

The main branch, Araneides, is characterized by many-sided evolution of the web, which is also reflected in various structural features. It is not certain whether the orb is the only primary type of web in this branch, but it is, in my opinion, common to Araneidae and Uloboridae be-

Table 51. Uloboridae: Hyptiotinae.

	<i>Hyptiotes</i>	<i>Sybota</i>	<i>Petrunkévitchia</i>
Figure	485, 515; MUMA & GERTSCH (1964)	484, 513 – 514	CHAMBERLIN (1916)
Size	medium – small	medium – small	small
Cribellum	wide $\pm$ oval	narrow, both ends curved backwards	narrow
Shape of ♀ abdomen	strongly gibbous with 2 rows of tubercles	wide oval with caudal projection	gibbous with 2 rows of tubercles
Shape of ♂ abdomen	oval with weak tubercles	narrow oval with caudal projection	narrow oval
Abdominal pattern	obscure transversal bands	very distinct transversal bands	longitudinal bands and rows of spots
Shape of carapace	very wide, heart-shaped	long oval	$\pm$ pentagonal
Position of PL	central – subcentral, submarginal	in anterior quarter, submarginal	in anterior third, submarginal
Size of eyes	PL > PM > AM > AL	AL smallest, others subequal	PL $\sim$ PM $\geq$ AM > AL
Shape of MOT	very strongly trapezoidal and wide	trapezoidal, ca. as long as wide	trapezoidal
Shape of LOT	very strongly trapezoidal and wide	trapezoidal, very wide	wide subrectangular
Fovea	transversal depression	longitudinal depression	transversal depression
Cheliceral armature	1 + 0 – 2 + 2	1 + 1	?
Shape of sternum	long, $\pm$ triangular	long, $\pm$ constricted in anterior half	long with rounded apex
Tib. & met. v. sp.	♀ 0 + 1 – 2, ♂ 1 + 2	♀ 0 – 1 + 1 – 4 irreg., ♂ 1 + 3 (pairs)	♀ 0 – 1 + 1
Tarsal spines	absent	II–IV: a few ventral	absent
Feathery hairs	numerous – sparsely	numerous	absent
Femoral trichobothria	I–II: 3 – 4 d., III: 6 – 10 prol. + 2 – 3 d., IV: 3 subapical in oblique row	II–III: 2 – 3 subbasal (? at least)	? (scarce)
Calamistrum	$\frac{2}{3}$ – $\frac{1}{4}$ of mt IV	$\frac{2}{3}$ of mt IV	rather long
Cymbium	long and narrow, strongly convex	long oval, strongly flattened	palpus not described
Palpal tibia	oval, ventrally flattened	subglobular, with obtuse dorsal projection	
Origination of embolus	basal	central	
Shape of embolus	very long and thin ($1\frac{1}{2}$ – $2\frac{1}{2}$ coils)	thin semicircular	
Conductor	large folded lamina embracing the whole bulb and palpal tibia, apex trifurcate	rather small lamina, apex bifurcate	
•Median apophysis•	large, curved apical projection	wide trifurcate lamina	
Epigynal plate	inverted T-shaped	transversal caudal	triangular
Epigynal foveae	$\pm$ oblique furrows	distinct oval lateral pits	oblique furrows
Special characters	legs very short	ocular area anteriorly with a hairy tubercle	IV patella with a pseudo-calamistrum
Distribution	Holarctic (– ? Ceylon)	C. & S. Neotropical	C. Neotropical

cause of common origin rather than parallel evolution, to say nothing of the alternative of true convergence.

As repeatedly shown in this paper, the plumose-laminar type is considered the basic hair type of Araneomorpha. This type of hair has persisted in all representatives of Uloboridae, while it is totally absent in the superfamily Araneoidea. The same is true of the feathery hairs, except that there are no such hairs in the Uloborid subfamilies Uloborinae and Tanga-roinae.

The absence of poison glands in Uloboridae is a well-known fact that excludes the derivation of Araneoidea from Uloboridae. Therefore the presence of common ancestors is the most

probable explanation of the relationship of these groups. It is also worth mentioning here that all the Uloborid species have an undivided cribellum, and that the colulus of all representatives of Araneoidea investigated up to-date is distinctly unpaired. Cf. also Dinopidae.

The basic pattern of the male genital organs is rather complicated both in Araneoidea and in Uloboridae. It is unlikely that either of them could be derived from the basic pattern of Amaurobiidae. On the other hand, the comparison of homologies between the details of Uloborid and Araneoid male genitals is difficult, as it is even for different groups of Araneoidea (LEVI 1961). The analysis of the evolution of the female genital organs is still more uncertain, and it is

Table 52: Uloboridae: Miagrammopinae.

	<i>Miagrammopes</i>	<i>Ranguma</i>	<i>Huanacauria</i>	<i>Mumaia</i>
Figure	506	508, 510 – 511	479, 507	509, 512
Size	♀ large-medium, ♂ medium	medium	♀ large-medium, ♂ medium	medium
Shape of abdomen ♂ ♀	cylindrical cylindrical, with caudal rectangle	cylindrical cylindrical	cylindrical cylindrical, centrally thickened	cylindrical cylindrical, centrally thickened
Anterior eyes	AM minute, AL reduced	reduced, or AM minute	AM minute, AL absent	absent
Cephalic furrows	anterior transversal + posterior semicircular	weakly developed	anterior transversal + posterior semicircular	posterior semicircular, anterior none
Maxillae	long semicircular	elongate	apically widened	long semicircular + acute apex
Length/width of carapace	1 1/4 – 1 1/2	2 – 2 1/4	1 – 1 1/3	1 1/2 – 2
I tibiae of ♂	numerous erect irregular curved spines	dorsal row of short spines + a few lateral spines	central row of erect spines + 2 lat. rows of normal spines	3 rows of short erect spines
I leg of ♂, other modifica- tions	femur bas. & prolat. + patella prolat. with strong spines	metatarsi apically narrowed	none	none
Femoral trichobothria II	10 – 12 on whole length	8 – 10 basally and centrally	8 basal in a dense row	ca. 30 on the whole length
III	2 rows, upper 3 basal, lower 9	5 basal	5 in a sparse row	ca. 30 on the whole length
IV	10 in central oblique row	15 in ventral oblique row	none	none
Trochanteral trichobothria	III – IV: 1	?	III – IV: 2	II – IV: 3
Ventral bristles on mt IV	long setae on the whole length	long spatulate on apical half	apical row + sparsely in basal half	on the whole length
Tarsal index I & IV	4 – 5, 2 – 3	3 1/2 – 4 1/2, 1 3/4 – 2	4 1/2 – 5, 2 – 2 1/4	4, 3
Length of calamistrum	1/3 – 2/5	1/3 – 2/5	1/2 – 2/3	1/2
Shape of cymbium	flat rectang., apically twisted	flat crescent-shaped	convex semicircular	long triangular
Shape of palpal tibia	long oval with lateral boss	long cylindrical	wider than long	long with acute process
Origination of embolus	basal	subbasal	subbasal	subbasal
Shape of embolus	basally curved spine	basally curved spine	semicircular thin	arched thin
Apex of conductor	long spine	short spine	laminar	laminar
Median apoph., ventral branch	acute ventral hook	thick, apically complicated	apically thick horn	scoop-shaped
Median apoph., dorsal branch	acute dorsal hook	short rounded bar	caudally pointed hook	short, towards the apex of conductor
Tegular apophyse	narrow T-shaped	transversal < shaped	T-shaped	falciform
Epigynal plate	caudal rounded projection	?	small, caudally notched	narrow ± membranous
Vulval structure	simple, ducts converging	?	rather simple, ducts converging	caudal projection ducts coiled
Special characters	posterior sternum of ♂ acute, I femur: 7 – 8 central trichobothria	ejaculat. duct strongly coiled, IV mt with long hairs	–	mt. with long plumose hairs, lateral foveae in epigyne
Distribution	Oriental – Ethiopian	Oriental – Australian	Neotropical	Neotropical – Texas

hardly ever possible in the different main branches of Araneomorpha.

The family Uloboridae has been divided into three subfamilies – Uloborinae, Hyptiotinae, and Miagrammopinae – by all the authors of this century, and their limitation has caused no difficulties.

In the present classification, the analysis of some little-known exotic genera has shown that some alterations in the classic subdivision are necessary. First, the structure of the genital organs of *Uloborus tahitiensis* and of some related species is quite different from that of all the species of my Uloborinae, and the spine and

trichobothrial patterns also deviate greatly. Therefore, in spite of its resemblance in general appearance to some nongibbous Uloborine species, a new subfamily Tangaroinae had to be created.

The Chilean genus *Sybota* has not been satisfactorily described, and therefore it is not surprising that the Mediterranean species *Uloborus productus* has been regarded as congeneric with the generotype of *Sybota*, and that this genus has been included in Uloborinae. In fact, *Sybota* is intermediate between the classical genera of Hyptiotinae and Miagrammopinae. It is here included in Hyptiotinae, but these two sub-

families could perhaps, be united as well. See also Table 51.

The concept of genus has been extremely vague in Uloboridae, and the subfamilies and corresponding type genera have been almost identically limited. I have tried to standardize the limitation of genera, at least among the groups treated. This has led to the creation of several new Uloborid genera for the less-known exotic species. The fundamental structure of the genital organs is the most practical key-character for most of them, but there are also numerous differences concerning other structural characters. See also Tables 49 – 52.

B. Araneioidea

The Ecribellate families of Araneides are here included in a large superfamily Araneioidea which is characterized by the simple-serrate type of hairs, more or less globose abdomen, trend to modification of the cephalic area and the shape of the abdomen, presence of paracymbium and terminal apophysis in the male palpus, lack of tarsal trichobothria, unreduced number of tarsal claws, etc. Altogether, there are no difficulties in the limitation of this superfamily, and any species can be placed in the correct superfamily even if only juvenile specimens are available. See also the general characteristics of Araneides on p. 288.

A more detailed phylogenetic analysis is outside the scope of this paper, and only the families with limitations I have accepted are listed here.

Araneidae is a large family with several specialized types. Theridiosomatinae is here included in it as a subfamily, although it has often been listed as a family of its own.

The complex Theridiidae – Symphytognathidae seems to need a relimitation of families, and the same is true of the complex Linyphiidae – Erigonidae – Nesticidae. In the latter case, the status of Nesticidae is rather a matter of opinion, while the Linyphiidae – Erigonidae part of this complex must be radically reclassified according to all characters. Most probably there are more than two main groups, but the naming of them will be a difficult problem.

Archaeidae and Mimetidae are the only groups of Araneioidea in which the spiders spin no web, but they are none the less typical web spiders inhabiting the webs of Theridid or other Araneoid spiders. Probably both of them are most

closely related to Theridiidae. For the limitation of Archaeidae, see p. 289.

Tetragnathidae is an excellent instance of parallelism and convergence. Representatives of this family and those of the Uloborid subfamily Miagrammopinae resemble each other in general appearance as well as in several details. For instance, these two groups are the only ones in the whole order of spiders in which there are complicated patterns of ventral femoral trichobothria. On the other hand, the reduction of the external epigyne of Tetragnathidae is an example of convergence through structural reduction. Most probably Tetragnathidae represent a highly specialized group of Araneioidea rather than a primitive one, and this family could perhaps be derived from some of the Araneid lineages.

8. Cribellata incertae sedis

The genus *Aebutina* is here listed as Cribellata incertae sedis. Only female specimens are known of *A. binotata*, which is the only true *Aebutina* ever described. The eyes of *Aebutina*

Table 53. Cribellata incertae sedis.

	<i>Aebutina</i>
Figure	443 – 444
Size	medium
Cribellum	broad and wide, bipartite
Pattern of spinnerets	AS rather long conical, MS well developed, cylindrical, PS long cylindrical, apical segment short
Shape of abdomen	oval, tapering towards both ends
Abdominal pattern	insignificant anterior folium; white reticulations
Shape of carapace	long oval, cephalic area wide
Fovea	indistinct small depression
Pattern of eyes	in 2 rows, all relatively small and widely separated, especially AL & PL
Cheliceral armature	2 + 4
Maxillae	distally rounded, laterally notched
Labium	as long as wide, distally rounded
Sternum	subtriangular, margins undulate
Feathery hairs	absent
Spines on legs	absent
Tarsal trichobothria	I – III: 2 central unequal, IV: 1
Length of mt/t:	1.1 & 1.8
I & IV	
Calamistrum	$\frac{3}{4}$ of mt IV, well developed and curved, mt IV distinctly flattened
♂ palpal structure	♂ unknown
Epigynal plate	caudal transversal plate
Seminal receptacula	oval
Vulval ducts	totally absent
Anatomical characters (MILLOT 1933 b)	poison glands well developed; thoracenteron moderately branched
Distribution	C. Neotropical (Brasil)

are in two rows as in most representatives of Amaurobioidea, but the total width of the ocular group is exceptionally great. On the other hand, the lack of a distinct fovea, the shape and colour pattern of the abdomen, and the curvature of the IVth metatarsus refer outside Amaurobioidea. SIMON (1892 a) originally placed *Aebutina* in Uloboridae as a subfamily of its own, but MILLOT (1933 b) showed by investigation of several anatomical characters that an affinity with Uloboridae is highly improbable. PETRUNKEVITCH (1923) had formerly transferred *Aebutina* to Dictynidae: Dictyninae, and this opinion was supported, with some reservations, by MILLOT (*op. cit.*). In my opinion, it cannot be included either in Uloboridae or in Dictynidae, and until the discovery of a male *Aebutina*, the placing of this genus in any of the known Cribellate families would be in conflict with their definition. Most probably a new family is needed for this genus, but the creation of a new category for one sex only is questionable, at least in this particular case.

9. Fossil families

The structure of the Paleozoic spiders is not sufficiently well known for a reasonable placing of them in the present classification, although the ancestors of Araneomorph spiders had certainly diverged then as a separate line of evolution. For Phalangitidae, see p. 303.

PETRUNKEVITCH (1942) created five new families for amber spiders, Adjutoridae, Arthrodictynidae, Inceptoridae, Insecutoridae, and

Spatiatoridae, and in 1950 a sixth one, Ephalmatoridae. I am not personally acquainted with the original material, but his detailed drawings make it possible to present some notes on the position of these families in the new phylogenetic classification.

The Cribellate family, Arthrodictynidae, seems to be problematical, if all the data mentioned by PETRUNKEVITCH (1942) is correct. However, it is possible that the segmentation observed is only an artefact, due to regular folding of the skin. If the segmentation is real, this poorly preserved specimen could represent an extinct primitive branch of Zodariides rather than Amaurobiides, or perhaps a completely extinct main branch.

Spatiatoridae evidently belongs to my branch Zodariides, and Adjutoridae to Araneides. In the latter family, the subfamily Adjunctorinae possibly belongs to another main branch, because that kind of trichobothrial pattern is unusual in any Araneoid spider.

The families Insecutoridae, Inceptoridae, and Ephalmatoridae cannot be placed according to the scanty information available; but probably Insecutoridae could be included in Amaurobioidea. For further discussion of these fossil families, see PETRUNKEVITCH (1942 and 1958).

Unfortunately, the information afforded by the fossil spiders known up till now is not significant for the phylogenetic analysis of the groups studied here, and the phylogeny of Amaurobioidea especially cannot be compiled according to fossil data.

VI. Remarks on the evolution of spiders

A comprehensive discussion of spider evolution is far beyond the scope of this paper, and therefore only a few selected problems have been touched upon here. Thus, e.g., an analysis of the course of adaptation in spiders has been omitted, because the more or less scattered conclusions achieved do not add any important information to the general theory of evolution. On the other hand, problems pertaining to structural reduction have been the subject of real argumentation. Some additional problems of spider evolution have been only briefly discussed. The evolution of the male and female genital organs has been thoroughly studied for the revisional part of this paper, but the res-

pective roles of adaptive and non-adaptive evolution could not be so clearly determined as to make practicable a more detailed discussion of the pattern of evolution in this character complex.

1. Evolution of the anterior median spinnerets

The evolution of different characters had to be thoroughly analyzed in compiling the classification presented, but the detailed results will be published separately. An exception has been made in the case of the cribellum, because the facts presented below constitute the most significant evidence for the familial revision.

A. Definition of homological structures

The presence of spinnerets on the caudal or ventral side of the abdomen is a character peculiar to spiders, although Pseudoscorpionids, some Amblypygids, and Tetranychid mites also have the ability to spin with organs located within the chelicerae, and homologous to the poison glands of spiders.

Most probably the oldest Paleozoic spiders had four pairs of spinnerets as do the recent Liphistids. The origin of the spinnerets was first found out by ZALENSKY (1871). JAWOROWSKI (1895) finally proved the homology of different pairs with the exopodites and endopodites of the pleopods of the 4th and 5th abdominal somites. Thus the anterior median spinnerets correspond to the endopodites of the fourth somite. In all recent spiders so far discovered, this pair has undergone some modification.

In this context, the evolution of the anterior median pair of spinnerets only has been discussed, while that of the other pairs has been extensively treated by MONTGOMERY (1909) and MACHADO (1944).

In the recent representatives of Liphistiidae, the anterior median spinnerets really exist as a paired tubular structure, but they have neither spinning tubes nor connection with the spinning glands in *Heptathela* and *Liphistius batuensis*, while there is a greatly reduced number of spinning tubes in *L. malayanus* and *L. desultor* (BRISTOWE & MILLOT 1932). In all these species the narrow, unsegmented anterior median spinnerets are morphologically very dissimilar to the well developed and multisegmented lateral pairs.

In all the Theraphosomorph families, the anterior median spinnerets are totally lacking at all known stages. The reduction of spinnerets in a certain order can be interpreted as an evolutionary trend characteristic of this suborder (PETRUNKEVITCH 1942, p. 156). This trend is not parallel with that in Liphistidae, although PETRUNKEVITCH (*loc. cit.*) erroneously described the anterior lateral spinnerets of *L. (Anadiastothele) thorelli* as unsegmented, evidently trusting to the original description of this species (SIMON 1903 a). Besides, the status of *Anadiastothele* has been finally determined by BRISTOWE & MILLOT (1932, p. 1024). According to YOSHIKURA (1958, p. 81), the embryo of *Atypus karschi* has no biramous appendages in the 4th abdominal somite, nor did MONTGOMERY (1909, p. 301) find any traces of the anterior median spinnerets

in the embryo of Theraphosid *Evagrus*. Thus it is evident that the Theraphosomorph spiders have no close relatives among the other groups of recent spiders, and they can hardly be derived from any extinct Cribellate groups. As the structure and number of the spinnerets in all Palaeozoic spiders is unknown, the phylogeny of this group remains obscure. According to a hypothesis of mine, a direct reduction of the anterior median spinnerets is the most probable alternative, but the position of this pair in the ancestral forms may have been the same as in any of the known patterns. In any case, it is justifiable to rank Liphistiomorpha and Theraphosomorpha as different suborders.

There is also a trend towards reduction of spinnerets in at least one line of Araneomorph evolution, that concerning the families Zodariidae, Palpimanidae, Mecysmauchenidae, and Cryptothelidae. Probably they are related to each other, but this is better explained by parallel reduction than by giving these groups a single lineage. The order of reduction in the Araneomorph spinneret pattern is largely dissimilar to that prevailing in Theraphosomorpha, indeed almost opposite to it. Thus the posterior lateral spinnerets are strongly reduced or lacking in some representatives of the families mentioned above, while the posterior median spinnerets are also lacking in Mecysmauchenidae. The reduction of the posterior lateral spinnerets of *Seothyra* and *Dorceus* (Eresidae) is also worth mentioning here, although this case may be convergent.

The anterior median spinnerets are represented in most Araneomorph families by a cribellum or nonfunctional colulus of variable size and shape. The reduction of the colulus is practically complete in some specialized groups of Araneomorph spiders. In several cases a careful investigation has revealed that there is a much reduced colular homologue even in those cases in which the lack of colulus has been generally accepted. Cf. also the parallel results obtained by MACHADO (1944).

The homology of the cribellum with the anterior median spinnerets was first anticipated by BLACKWALL (1833), and that of the colulus (hypopygium) by MENGE (1843), although some later authors, e. g., J. BERLAND (1913) were not of this opinion. Direct homology between colulus and cribellum was finally proved by F. DAHL (1901 a) by ontogenetic evidence afforded by *Calamistrula evanescens*. However, the tax-

onomic and phylogenetic value of cribellum and colulus was long underestimated, or even seriously misinterpreted.

BLACKWALL (1841 a) first proposed a separate family, Ciniflonidae, for some Cribellate genera, and O. PICKARD-CAMBRIDGE (1871) was the first to emphasize the presence of the cribellum as a familial character. Unfortunately, the other extreme was soon at hand, and the great majority of recent authors do not accept the inclusion of both Cribellate and Ecribellate genera in the same family.

The definition of the cribellum does not cause any decided differences of opinion, but a single case must be mentioned here. There is a totally nonfunctional cribellum in the male of some Amaurobid spiders, at least. For the sake of consistency, this structure should be called colulus, although current practice prefers the expression used above. Therefore the cribellum is here defined as constituting all those homologues of the anterior median spinnerets, in which the spinning glands are emptied through pores in a chitinous plate.

Concerning the colulus, there is still some disagreement as to the limitation of this vestigial structure. According to MONTGOMERY (1909), PETRUNKEVITCH (1923 and later), and GERHARD & KÄSTNER (1938-1941), the colulus is either a protruding process in front of the spinnerets or, if transversal, a chitinous plate distinctly limited. The concept given by MACHADO (1944) and LEVI & LEVI (1962) is much more comprehensive and includes even all the minute structures in which the presence of regularly arranged colular hairs can be observed. The number of these hairs may have been reduced to two, and in rare cases even to a single one.

In this paper, the colulus is defined as including any unpaired or paired vestigial structure homologous with the anterior median pair of spinnerets, independent of size, but unconnected with spinning glands of any type. The nonfunctional homologues of the other pairs of spinnerets are called lateral or posterior colulus, respectively. The concept of posterior colulus has already been introduced to arachnology by KASTON (1964), with reference to the unpaired vestigial posterior median spinneret of *Heptathela kimurai*. On the other hand, the reduced homologues of posterior lateral spinnerets, found in *Palpimanus*, have numerous spinning tubes and, being functional, they fall outside the concept of colulus.

B. Structural variation of cribellum and colulus

In order to get a complete view of the variation of these structures, I have investigated the structure of the cribellum in all Cribellate species available. All the Ecribellate spiders that have been revised here have been carefully analyzed as regards shape, size, and other characteristic features of the colulus. Besides, at least some basic types of all Araneomorph families have been investigated, if available. Furthermore I have made use of the excellent papers of MACHADO (1944) and LEVI & LEVI (1962). J. BERLAND (1913) has figured out the main structural types of cribellum.

The results of this comparative study are summarized below. No attempt is made here to describe all the variation that has been observed in different lines of evolution, but only the most important structural types have been listed, and the problems of parallelism and convergence in this structure are briefly discussed.

Cribellum. The anterior median spinnerets are represented by the cribellum in at least some species of Hypochilidae, Ectatostictidae, Hickmaniidae, Filistatidae, Thaididae, Megadictynidae, Oecobiidae, Dinopidae, Miturgidae, Amaurobiidae, Dictynidae, Zoridae, Ctenidae, Eresidae, Psechridae, Titanoecidae, and Uloboridae, and probably also in the fossil family Arthrodictynidae. Several basic types of cribellum have been proposed, but there seem to be numerous intermediate stages, and especially complicated patterns of convergence. Thus the description of the variation of different characteristics of the cribellum is here preferred to an elaborate system of structural types.

A key-character that has been repeatedly used in Cribellate spiders is based on a bifurcate grouping of the structural types into bipartite and undivided ones. In fact, the cribellum of Filistatidae, Dinopidae, Psechridae, and Titanoecidae is always distinctly bipartite, and the cribellum of Hypochilidae, Ectatostictidae, Hickmaniidae, Thaididae, Megadictynidae, and Uloboridae is always entire. The rest of the Cribellate families constitute the great majority of the Cribellata, and the above character cannot be used there as a key-character, except in a few cases between restricted groups of genera.

The taxonomic value of the cribellar septum

is especially low in the nominate subfamily of Dictynicae. The cribellum is bipartite in some species of *Archaeodictyna*, *Mallos*, *Mexillia* and *Nigma*, and undivided in some certainly congeneric species. On the other hand, the cribellum is always bipartite in *Brigittea*, *Dictynomorpha*, and *Marilynia*, but always undivided in most of the remaining genera that are closely related to them according to other characters. The cribellar septum has also been independently reduced in several lineages within Miturgidae, Amaurobiidae and Ctenidae.

It is a well known fact that the adult males of many Cribellate spiders spin no more webs (see, e.g., J. BERLAND 1913, NIELSEN 1932, and GERHARDT & KÄSTNER 1938 – 1941). Accordingly, the male cribellum is often more or less reduced. The reduction may concern the relative size only, but the cribellar septum also has often disappeared in adult males. This kind of sexual dimorphism is common in Amaurobiidae and Miturgidae, and probably present also in Eresidae: Penestominae.

Most of the Eresid spiders have a distinctly bipartite cribellum, but a peculiar modification has been developed in *Dresserus*. Most of the species of this genus have a quadripartite cribellum due to the presence of secondary longitudinal septa, while the primary median septum has disappeared in *D. tripartitus* Lawrence.

It is evident that the bipartite type is more primitive, corresponding to the paired structure of all the spinnerets proper. The development of a secondary septum is possible also at the median line, but such an explanation is not necessary in the argumentation of the present classification.

Most of the species with a bipartite cribellum have two long, laterally rounded plates. Plates of exceptional shape are found in most of the Filistatid species, and in the Ctenid genus *Acanthoctenus*, in which the development of equilaterally triangular plates is certainly a result of convergence. Plates of intermediate shape are present in several different groups, e.g., in some species of *Oramia*.

The size of the cribellum also varies greatly. It is as wide as the area of the spinnerets proper in all species of Psecridae, Titanoecidae, and Dinopidae, and in the Zorid genus *Zoropsis*. The cribellum of most species of the superfamily Amaurobioidea is distinctly narrower, while it has been strongly reduced in several different lines of this group (Dictynidae: *Altella*, *Anaxibia*,

and *Banaidja*, Amaurobiidae: Altellopsinae, and Miturgidae Tengellinae: *Uduba* and *Zorodictyna*). Sometimes both the shape and the size deviate largely in closely related species (*Oramia rubrioides* and *O. chathamensis*).

There are numerous minor modifications of the shape, but they seem to be phylogenetically insignificant. On the other hand, the exceptional oval shape of the cribellum of *Hypochilus* and *Ectatosticta* is worth mentioning here. Possibly the homologues of the anterior median spinnerets of their ancestors were long ago modified to an unpaired structure that is fundamentally dissimilar to the cribellum of the other primitive genera, *Hickmania*, *Thaida*, and *Megadictyna*. The cribellum of the latter genera is also undivided, but it superficially resembles the basic type of cribellum in Amaurobioidea.

Colulus. PETRUNKEVITH (1928) regarded the presence of colulus as a family character, and gave a complete list of all the known families of spiders in which it occurred. His list was compiled after investigation of only one or a few species from each of his families, most of which were polyphyletic groupings. Besides, his definition of the colulus was largely different from mine.

Nor have the different types of colulus been described in most of the later papers in which the presence of this structure has been discussed. The only detailed descriptions have been presented by MACHADO (1944) and LEVI & LEVI (1962), who also proved that it cannot be used as a family character.

The size of the colulus usually varies from that of the cribellum to a hardly visible vestige. Theoretically, the size of a nonfunctional structure is not expected to exceed that of the corresponding functional homologue. However, the colulus of some Araneomorph spiders is relatively larger than the cribellum of any recent spider. These are, e.g., «*Cybaeodes*» *incerta*, the Hersilid genus *Hersilia*, and some species of *Desis*. Obviously the increase in size has taken place since these structures ceased to be functional. A secondary function is not out of the question, but such a function has not been observed, at least in those genera with an exceptionally large colulus. In my opinion, the increase in size could be explained by the pleiotropic effects of some genes. This opinion is further supported by the fact that the considerable sexual dimorphism in the shape of the colulus in *Hersilia*,

makes no difference to its role in sexual behaviour.

In some lines of spider evolution, the bipartite cribellum has lost its function without previous disappearance of the median septum. The resulting paired colulus is sometimes large and easily recognizable, but the shape of the colulus has seldom been discussed at all, and therefore the concept of a paired colulus was unknown, for instance, to PETRUNKEVITCH (1928, 1933).

In my opinion, the presence of a paired colulus is a very useful character in phylogenetic analysis. The revision of the polyphyletic Agelenidae auct. is greatly aided by grouping the genera according to the structure of the colulus, because all true Agelenids have a typical paired colulus consisting of two, more or less protruding, obtusely triangular plates. On the other hand, the paired colulus is quite rare in other lines of evolution of the Amaurobioidea: there is a large colulus with median septum in *Tjurunga* and a third, broad type in *Titiotus*. Obviously these genera are not relatives of Agelenidae. Finally, all species of Hahniidae: Cryphoecinae have a strongly reduced colulus, represented by two symmetrical groups of a few hairs, and a similar type is found in some species of typical Hahnids (*Muizenbergia* and *Hahnia*). Thus Hahnids may be derived from an ancient group with bipartite cribellum.

The colulus of *Vulsor* (Ctenidae) externally resembles a typical paired cribellum of Amaurobioidea or Miturgidae, only the cribellar plate with pores has been reduced. A similar «non-functional cribellum» is present in adult males of many Cribellate spiders both in Amaurobioidea and Lycosoidea. Most probably the decisive reduction of this type is of quite recent date.

The colulus of Salticidae, Gnaphosidae, and Clubionidae is also paired. In these families there are no protruding structures at all, but the colulus is represented by a paired hairy area, which is usually poorly limited. However, the paired origin of this type of colulus seems to be indisputable.

Altogether, there are no lines of spider evolution in which the paired colulus has been observed to change to an unpaired one or vice versa.

The sclerotization of the colulus is rather variable, and this character can hardly be used as a key-character. Usually the sclerotization of the colulus is parallel to the general trend of the sclerotization of the abdomen. Thus a strongly

sclerotized colulus is common, e.g., in Zodariidae and related groups, Corinnidae, and several lineages of strongly sclerotized Araneoidea (*Cercidia*, *Pholcomma*, *Pelecopsis* and related genera). In the superfamilies Amaurobioidea and Lycosoidea, which are best known in regard to this character, and also known for the lack of abdominal sclerotization, there are some exceptions. These cases can be explained as due to some kind of secondary supporting function or the pleiotropic effect of some genes.

The well-sclerotized type of colulus in Amaurobioidea is usually large, semicircular, and thin. The marginal area often lacks hairs. According to a comparative study of other characters, it is certain that not all the Amaurobioidean genera with a well-sclerotized colulus are related to each other, although the coluli of *Cedicus*, *Rubrius* (*Pionaces*), and *Cambridgea* are strikingly similar. The colulus of *Machadonia* (Miturgidae) is thicker, while there are numerous intermediate types between the latter and the large, rhomboid type in Amaurobioidea (*Calacadia*, *Rubrius*, *Rhoicinus*, *Myro*, *Corasoides*, etc.). A still more weakly sclerotized colulus is found, e.g., in the Amaurobid genera *Namandia*, *Amphinecta*, and *Emmenomma*. The thick, semicircular colulus of the adult *Calamistrula* (Miturgidae) is also worth mentioning here as a deviating type of weakly sclerotized colulus.

The sclerotization of the most reduced types of colulus seems to be variable even within a single population, and often between closely related genera. Excellent instances are afforded by the Finnish species of *Evarcha* and *Heliophanus*. There is also considerable variation in the structure of different species of *Cybaeus* (Dictynidae) and also in the paired colulus of *Tegenaria* and *Coelotes*. Sometimes the size of the colulus is also extremely variable within a single genus, and then parallel to the degree of sclerotization. As an example, the colulus of *Desis kenyonae* is exceptionally large and well sclerotized, while that of *D. martensi* is almost totally reduced, and represented by hairs only. The reduction in size of the colulus is not dependent on the sclerotization in the superfamily Araneoidea, nor outside it, at least in Zodarioidea (*Cryptothele*). A large number of Linyphid (s. lat.) species have been examined for this very purpose, and the size, shape, and sclerotization of the colulus in this group seem to be exceptionally useful in compiling a phylogenetic classification.

A long, narrow colulus, resembling a spin-

neret proper, is extremely rare in the branch Amaurobiidae. Among the species that have been investigated by myself, an exceptionally long colulus has been found only in the genus *Oxyopes* (Pisauroidea: Oxyopidae) within the Amaurobiidae, while such a type of colulus is present in numerous lines of evolution in other main groups of Araneomorph spiders. The very large colulus of *Ochyrocera*, *Telema*, *Sicarius*, *Loxosceles*, and *Segestria* refers to a general trend of secondary modification of the colulus in the branch Filistatidae. However, the derivation of, e.g., *Ochyrocera* and *Sicarius* from ancient Cribellate spiders of Hypochilid type remains undoubted, and their colulus has certainly lengthened during a late stage of their evolution, probable because of some kind of secondary supporting function, or owing to pleiotropy. The colulus of some representatives of Filistatidae is rather small, and, in any case, of a short type (Plectreuridae, Oonopidae, Leptonetidae) or completely reduced (all Caponid species).

A long, narrow colulus is also present in *Hersilia* (Oecobiidae: Hersiliidae), and less characteristic in several lines of Araneoid evolution (*Steatoda*, *Pachygnatha*, *Hilaira* and related genera, *Helophora*, etc.). Sometimes the shape of the colulus is a useful taxonomic character within small groups, but not a key character proper (cf. LEVI & LEVI 1962). According to examination of the colulus of almost all species of Finnish Linyphids (s.lat.: about 250 spp.), it is generally a useful character in this family. No final division into subfamilies has been made in Linyphiidae, but the preliminary results of the evolution of the colulus well fit the results achieved from analysis of other characters, including the genital organs, patterns of male dimorphism, trichobothria, etc.

The most common types of colulus in Araneomorpha are a short, obtusely triangular hairy plate, or a central, triangular, unpaired hairy area. There are numerous intermediate forms which are not further discussed here, as these two represent the basic type of colulus that simply originates from the cribellum once its original function has ceased.

The most reduced form of unpaired colulus is a minute plate with a regular arrangement of 1 to 4 setae. MACHADO (1944) found a single seta in the Pholcid genera *Artema*, *Holocnemus*, *Physocylus*, and *Spermophora*. He also listed some Oonopid genera with 2 setae, and LEVI &

LEVI (1962) several Theridid genera with an equally reduced colulus. I have personally found this kind of strongly reduced colulus, e.g., in *Cryphoea* and *Tuberta* (Hahniidae: Cryphoeinae), *Scotina* (Liocranidae), *Zoica*, *Hestimodema*, and *Odo* (Zoridae), and *Cycloctenus* (Cycloctenidae). Outside Amaurobioidea and Lycosoidea the colulus is approximately reduced to that stage in *Eriauchenus* (Archaeidae), *Misumena*, and some other European Thomisids.

Spiders with a completely reduced colulus are quite rare. Fundamental reorganization of the spinnerets area has caused the total reduction of the colulus in Ammoxenidae, Caponiidae, Palpimanidae, Mecysmaucheniidae and Prodidomidae, as well as in some species of the subfamilies Hahniinae (Hahniidae) and Anagaphinae (Gnaphosidae). Besides, the colulus of Sparassidae and some species of Theridiidae, Zodariidae, Platoridae, and Pholcidae seems to be totally reduced.

The stage of reduction and the number of setae is variable in many of the genera examined (*Cryphoea*, *Xysticus*, *Cybaeus*, *Tegenaria*, etc.). MACHADO (1944, p. 19) even observed infraspecific variation in the number of setae from one to three in *Physocylus simoni*.

MACHADO (loc. cit.) also found a separate vestigial organ in front of the reduced colulus in several Pholcid genera. He named it mamillary plate («disque mamelonne»), but he did not know the origin of this structure. In all species of *Araneus* investigated by myself, there is an almost circular, strongly chitinized hairless plate between the colulus and the tracheal stigma. Most probably it is homologous to the mamillary plate mentioned above. These structures may represent the vestige of the cribellar plate, which has changed its position in relation to the vestiges of the colulus proper during the nonfunctional stage of its evolution.

A detailed description of the spinneret region in Sparassidae is presented below, because the homologies of the colulus cannot be shown there with certainty. The spinnerets proper of Sparassid spiders are superficially similar to those of Clubionidae and also to the basic pattern of the whole branch Amaurobiidae. The strong, conical, anterior lateral spinnerets are medio-basally surrounded by a narrow, well-sclerotized bar. A similar structure has been found in some species of *Ctenus* (s. lat.). Most probably this is due to convergence, although the adaptive

significance of this structure is not known. In any case, the presence of such a chitinous bar is a useful character in placing the Sparassid spiders. There is also a small chitinous plate between the anterior lateral spinnerets, and surrounded by the basal membrane. This vestige could hardly be regarded as homologous with the colulus, because of its position. On the other hand, the area between the base of the anterior spinnerets and the tracheal stigma is throughout densely covered with hairs in Sparassid spiders, thus hindering the observation and limitation of a possible vestigial colulus.

2. Origin of Araneomorpha

A description of the course of evolution of the anterior median spinnerets, together with a comparative analysis of the diversity of the cribellum and its vestigial homologues in all main lines of Araneomorph evolution, is the most convincing proof for the new phylogenetic classification of this group, as it is preliminarily presented in this paper. Results of the analysis of the evolution of several other characters also support the conclusions drawn from the former character, while there are no contradictions to the basic schema.

The monophylety of Araneomorpha seems to be indisputable but there are difficulties in tracing the ancient phyletic relationships between the three suborders of spiders.

The presence of paired, although more or less reduced, spinnerets proper in the place of the cribellum in Liphistiomorpha, and the lack of any structure homologous to the cribellum during the ontogeny of Theraphosomorpha suggest that both these groups belong to different lines of evolution than does Araneomorpha. There were unsegmented spiders in the Palaeozoic era (Pocock 1911), and it is highly probable that they are ancestors of the cribellate spiders and their derivatives, rather than their segmented contemporaries. However, all the most primitive spiders seem to have been segmented, as is still reflected in the ontogeny of Araneomorph spiders (cf. HOLM 1940 with numerous references). EMERSON (1961, p. 129) accounts for such a persistence of ancient characters on the basis of partial molecular identity of replicating genes.

The cribellum has evidently been developed from the short, wide pair of anterior spinnerets present in some Palaeozoic group of spiders. A

corresponding flattening of the posterior median spinnerets has taken place at least in some lineages of the Gnaphosidae-Platoridae complex, and in some Eresid spiders (cf. pp. 385 and 387). If this hypothesis be true, the cribellum must have originated as a paired structure, although some of the most primitive recent Cribellates have an unpaired cribellum. JAWOROWSKI (1895) has shown that the long, unpaired colulus of *Loxosceles* originates as a paired structure at an early embryonic stage. According to evidence based on other characters, this genus is probably rather closely related to *Hypochilus* and other primitive Cribellata. MONTGOMERY (1909, p. 33) described the early stage of the cribellum of *Filistata hibernalis* as a structure closely resembling the corresponding stage of the posterior median spinnerets. These observations confirm my opinion presented above, concerning the primitiveness of the bipartite cribellum.

Altogether, the problem of the derivation of the group Araneomorpha is in practice identical with the problem of the evolution of the cribellum.

3. Patterns of structural reduction

The evolution of the cribellum and its vestigial homologues is one of the central problems in modern arachnology, and the results which accumulate from the study of it are also of importance in general evolutionary theory. The structural variation of the colulus in different evolutionary lines shows that there is rarely any considerable decrease in the size of this vestigial structure once its original function has ceased, even in families which are generally regarded as among the most advanced on account of the stage of evolution of numerous other structures. These are Linyphiidae, Araneidae, Thomisidae, and especially Salticidae.

According to PROUT (1964, p. 242), the reduction of a vestigial organ is not considered likely to proceed once it has lost its function and when it has neither positive nor negative selective value. Although many authors (WEISMANN 1875, WRIGHT 1929 and later, DOBZHANSKY 1941, GREGORY 1951, ANFINSEN 1959, MERRELL 1962, and BRACE 1963) disagree with the hypothesis cited, it seems to fit well for the evolution of the colulus. Data obtained from the evolution of the colulus further confirm the statement of EMERSON (1961, p. 122), about the greater variability of vestigial structures when

compared with their functional homologues. BREDER (1944) also observed that the variability of a structure with a reduced function is well tolerated. These two conclusions are united by CARTER (1954, p. 47), who believed that micro-evolution is generally less adaptive than mega-evolution.

When the reduction proceeds there must be another explanation than a mere trend to reduction, or saving of energy (cf. DOBZHANSKY 1941, p. 344 and WEISMANN 1913, p. 108). Both these «explanations» are, in fact, teleological concepts that need a realization through one or more genetic systems. Such a contradiction in the argumentation of oriented evolution has been more thoroughly discussed by LAGERSPETZ (1959, p. 11–12 and PROUT *loc. cit.*). The former believes that «The factor which is responsible for the trends of evolution is natural selection, acting upon the genetically variable individuals of populations whose hereditary variability depends on mutations». Especially in regard to continued reduction of vestigial structures, HALDANE (1933), DOBZHANSKY (1941), and, most emphatically, BRACE (1963) account mutation pressure as the principal factor, while PROUT (*loc. cit.*) lists pleiotropy, genetic drift, meiotic drive, or accumulation of random mutations. The role of pleiotropy has already been discussed by WRIGHT (1929, 1956 and 1964).

The relative efficiency of most the factors listed above can be roughly estimated only in the structural reduction of spiders in general, and particularly in the case of the reduction of the colulus. Unfortunately, the evolution of genetic systems is poorly known in spiders and, therefore, all conclusions are still more or less speculative.

On the whole, the evolution of different characters is best known in the superfamilies Amaurobioidea and Lycosoidea. As described earlier in this chapter, the colulus is distinct in most species of these groups. Hence its exceptionally fast reduction in some lineages of these superfamilies is worth discussing here. The lack of a colulus in most typical representatives of Hahniidae: Hahniinae can be explained by the pleiotropic effects of the genes that contribute to the fundamental rearrangement of the spinnerets, but this presupposition does not cover the already rapid reduction of the colulus in Cryphoecinae and Cybaeolinae, both with an almost basic pattern of spinnerets proper. The

probable pleiotropic effects may concern some other characteristic of Hahniidae, but the dominance of other genetic phenomena is also possible.

If the reduction is considered likely to proceed, unless there is an altered, opposite trend because of a secondary function of the vestigial organ, such a function is expected to be approximately as common as a well-developed colulus. Now it is possible that a large strongly chitinized colulus has some supporting function, e.g., in *Hersilia*, *Loxosceles*, and a few additional genera, and a weak excretive function in some other genera. In my opinion, the scarcity of confirmed cases of secondary function of the colulus contradicts the hypothesis discussed here.

It has sometimes been insisted on that colulus and cribellum are parallel results of the evolution of the anterior median spinnerets. «The cribellum is a flat plate and if this were to lose its function surely we ought not to expect a remnant with colulus form, a remnant which is still more prominent in very young spiders than in adults» (BRISTOWE 1938, p. 300). Now we know that he was mistaken, and the explanation is simple. The cribellum is a specialized homologue of the anterior median spinnerets and the development of the porous plate is mainly responsible for the transversal form of the cribellum. When the function of this secondary structure ceases, no factors remain that would modify the basic elongate shape of this structure. It must be emphasized here that the halves of a bipartite colulus are also elongated unless the whole structure is excessively reduced. I am inclined to believe that none of the Ecribellate spiders with a long colulus can be directly derived from predecessors with unmodified anterior median spinnerets.

The role of structural reduction in the evolution of spiders is a well-known fact, and no attempt is made here to present a comprehensive discussion of the numerous characters affected. Some patterns of reduction, however, can be unambiguously explained.

The reduction of the unpaired tarsal claw is an excellent instance of adaptive evolution, and it is usually linked with some other structural modifications that are direct consequences of the reduction of the web, undeniably leading to hunting or crouching. The ultimate cause of reduction here is natural selection together with mutation pressure as in any sequence of strongly

adaptive evolution. Thus it is self-evident that such a reduction takes place repeatedly in several lineages, and a specific explanation is needed for the cases in which the reduction of tarsal claws has not yet been realized (Lycosidae, Cycloctenidae, most Amaurobiidae, etc.).

The disappearance of both external and internal segmentation has generally been accepted as a trend of Araneomorpha. This kind of «explanation» is intelligible, as the parallel reduction also occurs in some other relatively advanced groups of Arthropods (Acarina, Collembola: Symphypleona). The posterior segments of several advanced groups of insects have also been more or less fused together. However, each of these cases can probably be separately argued by a certain pattern of genetic mechanisms.

The segmental structure becomes impractical when any necessarily nonsegmental organ system considerably increases in size. Concerning the anterior part of the Arthropod body, more or less complete fusion has been realized at an early stage of the evolution of this phylum, evidently because of the wide space that is necessary for the musculature and excretory organs connected to the mouth parts and anterior part of the alimentary canal, or because of other relatively large and compact organ systems.

The reduction of the internal segmentation of spiders is a direct consequence of the excessive development of the spinning glands, when compared with any other excretive system of the Arthropod abdomen. Since the spinning glands have filled the space originally occupied by a single abdominal segment, any mutation towards the reduction of internal segmentation must be markedly advantageous in natural selection. This hypothesis is further supported by the fact that both internal and external segmentation have most completely disappeared in the superfamily Araneoidea, in which evolution has been continuously dependent on web-spinning habits. For details of the comparative anatomy of spiders, see PETRUNKEVITCH (1933), FAGE (1937), FAGE & MACHADO (1950), CROME (1955 b) and FORSTER (1958).

The basic difference in the shape of the abdomen of Araneoidea and, e.g., Amaurobioidea and Lycosoidea, is obviously also a result of the increase in the relative size of the spinning glands. The presence of a soft abdominal integument as a basic pattern of spiders, especially

in the suborders Araneomorpha and Theraphosomorpha, in contrast to most other groups of Arthropods, can likewise be explained by the wide potential range of variation of the abdominal volume, needed for different phases of the spiders life, according to the variable requirements of spinning activities.

The relative size of the spinning glands of Liphistids, the only recent spiders with segmented abdomen, is smaller, at least on an average, than that of the Araneomorph spiders (cf. the descriptions by MILLOT in BRISTOWE & MILLOT 1932, and ATANASIU-DUMITRESCO 1941 a).

Along with the increase in the size of spinning glands, there is an increase in the relative space occupied by the musculature of the spinnerets, promoting the reduction of internal segmentation. The topography of these muscles has been described for several types of Araneoidea and a few Amaurobioidea by ATANASIU-DUMITRESCO (*op. cit.*).

The abdomen of Amblypygi is distinctly segmented, while this group strongly resembles the order Araneae in many other characters. This is an additional proof that the predominance of spinning activities influences the direction of the structural evolution of the spider abdomen.

The fusion of the caudal segments of many insects can be interpreted as a result of relative increase in the size of the sexual organs, while there is no caudal reduction of segmentation in Chilopods, in which the genital organs are also caudal but simpler and less voluminous.

I am not acquainted with the course of evolution of Acarina and Collembola: Symphypleona, but it is evident that there is also a natural explanation for the reduction of segmentation in these groups.

Now it may be concluded that the structural reduction either in spiders or in the phylum Arthropoda in general is not directed by a single, oriented trend, but rather is only a direction of evolution realized through largely variable patterns of genetic phenomena, in the range of both adaptive and nonadaptive evolution.

4. Nonadaptive evolution of spiders

Although the structural reduction of vestigial organs is generally considered a special case of nonadaptive evolution only (e.g., PROUT 1964, p. 239), the factors determining the evolution

of the colulus are certainly dissimilar to those prevailing in the evolution of some other non-adaptative characters in spiders.

The most striking instances of nonadaptive evolution in spiders are connected with the sexual dimorphism. The existence of bizarre structures is best tolerated when they are present only in adult males, because in most spiders their life-span is very short, and their characters operate in natural selection mainly through their availability and usefulness during the courtship period. The peculiar modifications of the male carapace of Erigonid and some Theridid genera is a well-known fact, and at least a part of the huge diversity of palpal modifications in almost any group of Araneomorpha might be referred to as nonadaptive evolution. One of the most extreme cases seems to be the excessive increase in size of one palpus, and the resulting rudimentation of the other in the Theridid genus *Tidarren* (cf. CHAMBERLIN & IVIE 1934). There seems to be only a tendency to modification, at least in regard to the male carapace, while the direction of the modifications is mainly due to random mutations. Here the hypothesis of BRACE (1963) may be valid, and the important role of pleiotropy cannot be denied. It is further possible that even some considerable modifications of the Erigonid carapace are

realized by very few alleles or by a single one, while the site of these genes may be disposed for repeated chromosomal mutations or adjacent activating genes.

The evolution of the female epigyne is, to some extent, dependent on that of the male palpus, although the classical concept of «lock and key» has been largely exaggerated. On the contrary, the complexity of the male genital organs does not provide a complex epigyne, but only the shape of the apical part of the embolus and one or two apophyses acting as locking mechanisms, in fact correlate with the structure of the epigyne. These locking apophyses may belong to the palpal tibia and patella, as in typical representatives of Dictynidae (cf. also CHAMBERLIN & GERTSCH 1958), but sometimes they are restricted to the bulbal organs (see LEVI 1961).

Excessive dimensions of the epigyne do not seem to be correlated with the size or complexity of the male genital organs (e.g., *Helophora*, *Amphinecta*).

There are numerous described cases of mimicry and other patterns of adaptive colouration in spiders, but the complicated patterns of some Araneids, Salticids, and Thomisids can probably be referred to nonadaptive evolution.

VII. Description of new species

When genera have been limited and defined by standards consonant with a strictly monophyletic grouping, and when, in addition to key characters proper, the range of variation of some important inconstant characters has been given, the species of a revised group of spiders can be unambiguously identified according to one or a few accurate figures of the genital organs. In the past, there have been variable standards for this procedure, but most authors have concentrated on a detailed verbal description of numerous easily observed structures, usually laying no emphasis on the infraspecific variation and standardization of measurements.

In this chapter, a short description is given of such new species, investigated during the course of the present study, as represent the generotype of a new genus. For the characters used, see the corresponding key-tables in Chapter V.

Yupanquia schiapellii sp. n. (Amaurobiidae: Macrobininae)

♀ – Carapace 2.4 mm, cephalic area wide in comparison with the average Macrobinine type, practically unicolorous. Anterior row of eyes strongly procurved, AM more than twice as small as AL. Posterior row also procurved, the eyes subequal in size and at equal distances from each other. MOT is distinctly trapezoidal, AM being less than half the size of PM. Fovea long and narrow.

Chelicerae strong, fangs long, cheliceral margin oblique. Anterior margin of cheliceral groove with two large teeth and an additional minute denticle, all in the upper corner of the groove. Posterior margin with ten teeth, gradually decreasing in size towards the base. The most distal teeth are also the furthest apart. Maxillae relatively wide, distally drawn to an obtuse angle. Labium as long as wide, apically obtuse. Sternum rounded quadrangular, only a little wider anteriorly. It has an acute apex between the fourth coxae.

Abdomen oval, with a distinct pattern of the basic Amaurobioidean type (cf. *Rubrius*). Cribellum small, undivided, with the anterior and the posterior margins practically parallel to each other. Spinnerets proper short and thick, the posterior pair only slightly narrower than the

anterior one. The apical segment very short in both. Tracheal spiracle insignificant, close to the spinnerets.

Epigyne large and well-sclerotized, anteriorly rugose (Fig. 148).

Legs of normal Macrobuline type, uniform light brown. Tibiae and metatarsi ventrally with three regular pairs of moderate spines, tarsi spineless. Trochanterae unnotched. Calamistrum short, consisting of only about ten hairs. Trichobothrial pattern follows the basic Amaurobiidae type.)

Holotype ♀ from Tucuman, the Argentine, coll. Silvestri (Paris).

Obatala armata sp. n. (Amaurobiidae: Macrobulinae)

♀ - Carapace 2.1 mm, its shape corresponding to the basic Amaurobiidae type. There is an indistinct longitudinal pattern with two wide, partly broken, darker lines and quite distinct dark striae. Anterior row of eyes slightly procurved, AM a little smaller than AL, less than their own radius apart, and less than their own diameter from AL. Posterior row of eyes more procurved. Diameter of PM equal to the width of the oval PL. Posterior eyes widely spaced: PM about one diameter from PL and slightly more from each other. MOT much longer than wide, anteriorly narrowed, AM almost as large as PM. Fovea long and distinct, surrounded by a shallow, oval depression.

Chelicerae moderate in size, with a rounded anterior boss. There are a few coarse bristles at the top of this boss in addition to the normal hairs. Cheliceral groove oblique as in most Macrobuline genera and species. Its anterior margin is armed with four unequal teeth set close to each other, the posterior margin with a single subapical tooth, followed, after a distinct gap, by a dense row of about five denticles.

Maxillae rather short and thick, trapezoidal. Labium wider than long, apically widely notched. Sternum heart-shaped, exceptionally wide in comparison with the normal Macrobuline type.

Abdomen oval, with a narrow indistinct, dorsal pattern of the Amaurobiidae type. The ventral side is grey, marbled with light brown. The small cribellum constitutes a procurved arch, anteriorly covered with black hairs. Spinnerets proper, especially the posterior pair, more slender than the average of Macrobulinae. Apical segment of both anterior and posterior pairs conical, but fairly short. Median spinnerets well developed, cylindrical. Tracheal stigma short, well sclerotized, close to cribellum.

Epigynal area much wider than long. There is an unpaired, anteriorly tapering, chitinous arch surrounding the unpaired oval central fovea that is visible only in posterior view. The triangular arch is laterally limited by furrows (Fig. 175).

Legs of normal Macrobuline type, indistinctly marked with wide, darker annulations. Anterior tibiae with 4-5 pairs of long ventral spines, all other tibiae and all metatarsi with three pairs of ventral spines. Femora with an apical pair of short spines dorsally, and a single central spine. Sometimes there is also an additional apical spine. Trochanterae unnotched.

The trichobothrial pattern deviates somewhat from the basic Amaurobiidae type. The most apical trichobothria in each segment is exceptionally long, and the length decreases abruptly towards the base of the segment. There are three pairs of distinct trichobothria in the tibiae, and 4-6 in a single row in both metatarsi and tarsi. There are also rather well defined 'indistinct trichobothria' in both

the pro- and retrolateral sides of the tarsi, metatarsi, and tibiae. No tarsal scopulae.

Holotype ♀ Clarwilliam district, Sederberg, Capland (Tervuren), coll. J. Smith VII. 1957. There are also some paratypes with similar data, apart from the date.

Yacolla pikelini sp. n. (Amaurobiidae: Altelopsinae)

♀ - Carapace 1.2 mm, relatively a little longer than the basic Macrobuline type, unicoloured. Anterior row of eyes strongly procurved, posterior row less procurved. All the indirect eyes of approximately equal diameter, diameter of AM about half of this. All the anterior eyes practically touching, posterior eyes less than one diameter apart. MOT slightly wider than long, strongly trapezoidal. AM separated from PM by less than their own radius. Fovea short and narrow, but distinct (Fig. 183).

Chelicerae moderate, with a rounded anterior boss, the latter bearing two coarse submedian bristles. Cheliceral margin rounded, anterior margin of the cheliceral groove with three almost equal teeth close to each other, posterior margin with five or six small teeth.

Maxillae parallel-sided, apically drawn to an obtuse angle. Labium as long as wide, apically strongly notched. Sternum oval, distinctly longer than wide, caudally projecting to a wide triangle between the fourth coxae.

Abdomen long and narrow, its dorsal pattern of the simplified Amaurobiidae type, known to occur, e.g., in *Cryphoea*, *Muizenbergia*, some *Badumna*, etc. Ventral side light brown. The small cribellum has parallel margins, and it is covered with light hairs, except on the reduced cribellar plate. Anterior pair of spinnerets thick, conical, and close to each other. Posterior spinnerets slender, their apical segment conical and rather longer than wide. Tracheal stigma indistinctly sclerotized, close to the cribellum.

Epigyne with a small caudal plate, resembling that of *Neuquenina*. There are two pairs of seminal receptacula unique in Altelopsine genera (Fig. 190).

Legs short and thick, light brown. Anterior tibiae ventrally with four pairs of short spines, other tibiae with from none to two pairs of weak short spines. Anterior metatarsi with three pairs of ventral spines, other metatarsi with two pairs of weak ventral spines. Tibial and metatarsal trichobothria short and sparse. Tarsi with three trichobothria, the most apical one much longer than the others. Trochanterae unnotched. Calamistrum strongly reduced, consisting of four or five subbasal, slightly curved hairs. Paired tarsal claws strongly curved, comblike, with numerous long teeth. Unpaired claw with two or three teeth. No tarsal scopulae.

Holotype ♀ Bella Vista, Paraná, Brazil (Paris), coll. Silvestri.

Kidugua spiralis sp. n. (Agelenidae: Ageleninae)

♀ - Carapace 2.4 mm, pear-shaped, cephalic area long, separated from the thoracic area by a well defined depression in the marginal line. Colouration of carapace dark brown, but with light submarginal bands and a caudal triangle behind fovea. There is a narrow dark stripe along the margin. Ocular area strongly convex and anteriorly raised as in *Textrix*, *Melpomene* and some other Agelenine genera. Both eye rows strongly procurved, so that AL are separated from the clypeal margin by less than their diameter, while AM are separated from it by about twice their own diameter. The order in size is PL, AL, PM, and AM, but the difference between the largest and the smallest eyes is only a fourth

of the diameter of AM. MOT longer than wide, almost rectangular. Anterior eyes half their diameter apart, posterior eyes slightly less than their diameter apart. Fovea deep, caudally widened.

Chelicerae short and thick, distinctly conical in profile. Cheliceral margin rounded, weakly oblique. Anterior margin of cheliceral groove with one large tooth and a small one situated more basally, and two or three minute teeth on the distal side of the large tooth. Posterior cheliceral margin with four teeth, the one next to the most basal one distinctly the smallest. Maxillae with parallel margins and rounded apex, moderately converging. Labium wider than long, apex obtuse. Sternum wide, heart-shaped, strongly convex. Its apical triangle is caudally rounded. The sternal surface is sparsely covered with distinct pits, which may represent points of insertion of hairs, although there are no hairs in the holotype. The margin of these pits is considerably raised over the sternal surface. The sternal margin is undulate, there are dark, obscurely limited patches opposite each coxae, and the caudal triangle is also dark at the edges.

Abdomen oval. Dorsally there is a parallel-sided, reddish brown central folium, while the marginal parts are marbled with dark and light brown. Ventral side with a subcaudal, U-shaped dark figure and a few dark spots along the margins. Anterior pair of spinnerets cylindrical, their own basal diameter apart. Basal segment of posterior spinnerets equal to the anterior pair in shape and size. Both are partly black. Apical segment of posterior spinnerets slightly longer and narrower than the basal one, with some sparsely distributed spinning tubes ventrally. Median spinnerets almost as large as the anterior ones, but light coloured. The colulus consists of two minute knobs set wide apart. There are three long, strongly converging setae in each of these knobs. Tracheal stigma very small and weakly chitinized, close to the vestigial colulus.

Epigyne with a transversal anterior pit, the margins of which are continued to form an inner spiral as in *Tortolena*. Posterior part with a triangular depression (Fig. 218).

Legs long and slender, very distinctly annulated on femora and tibiae, less distinctly on metatarsi. Leg spinulation rather irregular, but there seem to be four pairs of ventral spines on the anterior tibiae, and three pairs on the remaining tibiae and on all metatarsi. Femora with three or four dorsal spines. Tarsi with from one to four strong central and subapical spines. The trichobothria of the holotype have been mostly rubbed away, but all the trichobothria are obviously short when compared with the basic pattern of Amaurobioidea. The distribution of the trichobothria, however, corresponds to this basic pattern. There are weak scopulae in the apical parts of the tarsi. Trochanterae unnotched.

Holotype ♀ from Kivu, Kasuo, the cave of Kabwe-Ka-Ndongwe, terr. Lubero, Congo; coll. R. P. J. Celis 26.I.1955 (Tervuren).

Olorunia punctata sp. n. (Agelenidae: Ageleninae)

♂ – Carapace 2.9 mm, shape as in the preceding species. Colouration also similar except that the cephalic area is centrally light, and the dark marginal stripe is much less distinct. Ocular area drawn to a snout that is more protruding than in *Textrix* and related genera. Relative width of clypeus approximately as in *Kidugua spiralis*. Both rows of eyes strongly procurved. Order of size of the eyes: AM, PL, PM, AL, but the differences are small. All posterior eyes are their own radius apart, and the anterior eyes barely so.

MOT much longer than wide, anteriorly slightly narrowed. Fovea narrower than in the preceding species, caudally followed by a light hairy area.

Chelicerae long, conical. Cheliceral margin oblique. Anterior margin of the cheliceral groove with three true teeth and two additional, more distal, minute tubercles. Posterior margin with 4 teeth, increasing in size towards the base of the chelicerae. Fangs long, moderately curved. Maxillae with parallel sides and with an obtuse angle apically. Labium slightly wider than long, apically notched. Shape of sternum as in *Kidugua spiralis*, light brown, darkening gradually towards the margins, and covered with long dark bristles and white feathery hairs.

Abdomen narrow oval. There are a well defined, lancet-shaped, brown anterior folium and two rows of dark lateral patches along the caudal half of the dorsal side. Ventral side of abdomen light brown. Anterior spinnerets cylindrical and as wide apart as the length of the basal segment of posterior spinnerets, but the former are considerably longer, and ventrally and dorsally suffused with dark brown pigment. Apical segment of posterior spinnerets longer than the basal one, slender and light in colour. Median spinnerets distinctly smaller than the anterior ones. The paired colulus consists of two separate, long plates at an obtuse angle to each other. Each of these plates bears four or five strong bristles and a few short hairs. Tracheal stigma small and weakly sclerotized, its own length away from the colulus.

Legs long and slender. Femora with dark base and indistinct annulations, remaining segments practically unicoloured. Leg spinulation somewhat irregular, spines long and strong, except the apical ring of metatarsi. Femora with an apical pair of spines and two unpaired dorsal ones, tarsi with from none to two subapical spines. Trichobothria short and mainly rather indistinct, but the basic pattern of Amaurobioidea can be traced in the tarsi at least. Short outstanding hairs sparsely distributed on the ventral side of the tarsi, but true scopulae are lacking or represented by a short apical tuft of hairs. Trochanteral margin distinctly rebordered. Tarsal claws slightly curved, with six or seven teeth basally, unpaired claw with a single tooth.

Male palpus (Fig. 214) especially characterized by the flat tegulum and the laminar patellar process.

Holotype ♂ from Costermansville, Congo, coll. Budo 3.VI.1937 (Tervuren).

Mashimo leleupi sp. n. (Dictynidae: Dictyninae)

♀ – Carapace 1.2 mm, pear-shaped, cephalic area separated from thoracic one by a distinct furrow. Thoracic area has radiating shallow depressions. Cephalic area is brown in the centre and covered with white hairs, laterally blackish brown. Thoracic area dark brown with black striae, but the margins are light yellow, and a few white chalk bodies shine through the marginal integument. Ocular area broad, eyes exceptionally small. AM largest, others slightly smaller, subequal. Both rows of eyes practically straight. AM $1\frac{1}{2}$ times their own diameter apart, and slightly less than this from AL. PM $2\frac{1}{2}$ times their own diameter apart, and about 3 times their own diameter from PL. MOT wider than long, rectangular. Clypeus vertical, more than twice as high as the diameter of AM.

Chelicerae strong, conical, with low anterior boss. Anterior margin of cheliceral groove with four strong teeth, posterior margin with a single small tooth opposite to the most apical tooth of the anterior margin. Fangs short, moderately curved. Maxillae long, oval. Labium longer than wide, anteriorly

tapering. Sternum as wide as long, heart-shaped, caudally obtuse. There is a light, bald, oval area in the centre, while the marginal areas are darker brown and covered with dark hairs.

Abdomen large and oval, slightly gibbous. Dorsally it has a wide folium with dark brown Δ -shaped figures, while the marginal areas are light, and white reticulations shine through the integument. Laterally there is a row of large dark patches, while the ventral side is uniformly light. The shape of the spinnerets proper corresponds to the basic pattern of Dictynidae (e.g., *Dictyna* and *Emblyna*). The posterior spinnerets are almost black, the others light. Cribellum large, undivided, with a wide hairy area anteriorly. Anterior margin of cribellar plate slightly concave, posterior margin centrally straight, lateral thirds gradually diverging. Tracheal stigma as wide as cribellum, procurved, slightly less than its own width from the cribellar plate.

Epigynal area strongly sclerotized and caudally raised, resembling that of *Anaxibia caudiculata*. There are distinct lateral foveae close to the anterolateral corners (Fig. 337).

Legs spineless, coxae whitish, remaining segments yellow. Metatarsi with a distinct trichobothrium, its position in first three legs about 0.70–0.75, in fourth leg about 0.85. The fourth metatarsi moderately curved and depressed. Calamistrum consists of 18–19 strongly curved hairs extending a little beyond the middle of the segment.

Holotype ♀ from Abereoru, River Mwengo, Northern Rhodesia (1 800 m above sea level) coll. N. Leleup, June 1960 (Tervuren).

Tahuantina zapfei sp. n. (Dictynidae: Dictyninae)

♂ – Carapace 1.8 mm, wide pear-shaped. Margins of cephalic area short, but dorsally there is a large elevation behind the ocular area. This elevation is abruptly limited by the low thoracic area. Whole carapace dark brown, cephalic area with lighter hairs, especially around the eyes, but more caudally with dark hairs also. Ocular area narrow when compared with the basic pattern of Dictyninae. Anterior eye row recurved, posterior row weakly procurved. Order of size of eyes: AL, AM, PL, and PM, but the difference between AM and PL is small. AM their own diameter apart, and their own radius from AL. Posterior eyes evenly spaced, about twice their diameter apart. MOT large, quadrangular. Clypeus oblique, its height slightly less than 3 times the diameter of AM.

Chelicerae three times longer than wide. Basolateral condyle rather elongated, but there are none of the striking modifications typical of the males of most Dictynine species. Anterior face of chelicerae moderately concave in profile. There is a long oval pit between the chelicerae, but it is relatively much narrower than in most species of *Emblyna* and *Dictyna*. Cheliceral margin rounded, but there is no well-defined cheliceral groove, nor any teeth behind the fangs. Anteriorly there are three strong teeth constituting a compact group. Fangs relatively short. Maxillae exceptionally long, about three times longer than wide. There is a protruding basal boss similar to that of *Dictynomorpha* and *Ajmonia*. Sides of maxillae parallel, apex medially tapering and darkened. Labium about 1½ times longer than wide, its apical half strongly tapering, but the apex proper blunt. Sternum a little longer than wide, oval, caudally drawn to a rounded apex.

Abdomen oval, not modified, dark brown with no pattern. Pattern and shape of spinnerets as in *Emblyna* and *Dictyna*,

colouration dark brown. Cribellum well-developed, slightly narrower than the width of the spinnerets area. Cribellar plate undivided, narrow oval, posteriorly limited by a wide, hairy base. Tracheal stigma as wide as the spinnerets area, very close to the base of the cribellum.

Legs short and thick, spineless, colouration brown to dark brown. There is a metatarsal trichobothrium at 0.75–0.85. The length of this trichobothrium is equal to or slightly less than the diameter of the metatarsus. Fourth metatarsus neither curved nor flattened, calamistral hairs short, not strikingly dissimilar to the surrounding normal hairs. Length of calamistrum about half the length of fourth metatarsus.

Male palpus (Fig. 326): Femora with a subapical ventral boss, patella unarmed, tibia with an exceptionally large dorsal process. This process has three strong ctenidia. There is also a lateral tibial lamina with an acute, hook-shaped, distal process. Bulbal organs simple, tegulum basally protruding. Embolus short, distally unmodified, conductor caudally pointed, simple.

♀ – Carapace 1.7 mm, practically identical with that of the male. Chelicerae slightly shorter than in male, but similarly modified. Cheliceral margin with a protruding chitinous keel, on which three or four teeth constitute the serrate margin. Maxillae modified as in male, but a little shorter. Labium with a central swelling basally.

Abdomen relatively larger than in male, but similar in shape and colouration. Cribellum somewhat larger than in male, the cribellar plate especially being better developed.

Epigynal area with a heart-shaped, well-defined depression. A single pair of minute foveae at the anterolateral corners of the depression.

Legs as in male, except that IV metatarsi are distinctly flattened. Calamistrum is also more distinct, denser, and extends three quarters of the way along this segment.

Holotype ♂, allotype ♀ and a paratype ♀ from Chile without additional data (Paris), but preliminarily assigned to Dictynidae by SIMON as an undescribed species. 2 ♀♀ from Illapel-Caimanes, Chile, coll. H. Zapfe-Mann, March 1964 (Santiago), accord well with the description of the type material, but the femora of these specimens are distinctly darker than the more apical segments. This may be due to long preservation of the type material.

Wajane armata sp. n. (Eresidae: Penestominae)

♂ – Carapace 2.1 mm, flat, cephalic area very short. Colouration reddish brown, completely covered with short, white hairs. There are also longer, darker bristles along the clypeus and laterally to the ocular area. Fovea quite shallow, wide, and indistinctly limited.

Chelicerae rather long and narrow, obliquely directed, fang short. Anterior margin of cheliceral groove with a low chitinous keel that is armed with four teeth, the next to the most basal being the largest. There are also two chitinous knobs immediately behind this keel, but they are too close to the anterior margin to represent a true armature of the posterior margin of the cheliceral groove that is lacking in other Eresid species. Maxillae basally wide, triangular, but the apical part has parallel sides and a rounded apex. The maxillae are quite parallel to each other, and therefore separated by the whole width of the labium. The latter is longer than wide, its apical part is tapering, but widely rounded at the apex. Sternum long oval as in *Penestomus*, caudally projected between fourth coxae, the apex rounded.

Abdomen long oval, strongly tapering towards both ends, and somewhat flattened. Anterior margin truncate, caudal

end pointed. Anal tubercle well-developed, triangular. There are white patches at the anterolateral corners of the dorsal side, and a pair of broader, transversal white patches at the widest point of the abdomen. Remainder of dorsal side yellowish brown. Ventral side unicoloured, lighter brownish yellow. Anterior spinnerets conical, dorsoventrally flattened and their basal diameter apart. Posterior spinnerets shorter, cylindrical, and much narrower than the anterior pair. Apical segment of both these pairs as long as wide, conical. Median spinnerets acutely conical, a little shorter than the posterior pair. The homologues of the anterior median spinnerets are represented by an unpaired, narrow, strongly curved, and weakly sclerotized plate in front of the spinnerets. Evidently this is a case of nonfunctional colulus, but the weak sclerotization of the whole caudal end of the holotype hinders further interpretation of the structure of this colulus, as such unique in Eresidae. Tracheal stigma as wide as the spinnerets area, separated from the colulus by its own width.

Legs rather short, weakly sclerotized in the holotype. Coxae exceptionally long, especially in fourth leg, in this

respect resembling the Platorid spiders. Trochanterae unnotched. Femora thick, armed with a single dorsomedian spine, much darker than the remaining segments of the legs. Tibiae with numerous short spines on ventral and lateral sides; they are quite irregularly arranged. Metatarsi also with irregular spinulation, although a basic pattern of three ventral pairs of spines might be traced. Tarsi spineless, more or less rigidly joined to metatarsi as in all Eresid species. Three tarsal claws, all with teeth. An oval area around the unpaired claw, densely covered with short hairs, also proves affinity with Eresids. Neither calamistrum nor any distinct trichobothria can be seen in the holotype, but its hair covering has been mostly rubbed away. The male palpus (Figs. 470 and 471) is characterized by a large, bifurcate tibial process and a large and complicated median apophysis, both of these characters being unique among Eresids. The coiled embolus runs inside a fold of the conductor. Moreover, there is a central membranous plate arising from the tegulum and supporting the apical parts of conductor and embolus.

Holotype ♂ from Alicedale, South Africa, coll. F. Cruden, Jan. 1916 (Geneva).

VIII. Main conclusions

The results presented in this paper are based on an extensive revisional work concerning mainly the Cribellate spiders and their most close Ecribellate derivatives, but in order to get a preliminary classification of the whole suborder Araneomorpha, numerous representatives of other families have been studied. A revision proper of families and genera has been presented only for the first-named groups.

A phylogenetic classification only has been accepted here, and whenever this principle could not be followed, the corresponding part of the schema has not been compiled, but the known facts only have been discussed.

The evolution of all morphological characters has been traced as far as it has been possible in practice, and other kinds of characters have also been used, whenever reliable data have been available. No characters have been preferred in the compilation of schemata and limitation of single taxa, and the role of convergence and parallelism has been carefully weighed.

Theoretical results of the present study will be treated separately, as will the description of the course of evolution of most single characters.

Morphology

Concepts of several morphological structures are redefined, as differing concepts have repeatedly given rise to disagreement. Besides, several morphological details have been gener-

ally misinterpreted, evidently because many previous authors failed to make use of good optical apparatus. Some previously unknown structures are also described, but, as the emphasis has not here been laid on morphology, the information about them is scattered. The most important morphological findings are listed below.

Hair structure. Until now, the concepts simple hairs and plumose hairs have been used to refer to structures visible at a magnification of 10–100 times, that is, with an average stereonic microscope. However, the microstructure of the hairs as seen at a magnification of 500–1 800 times reveals that there are three basic types of hairs, referred to in this paper as simple-serrate, plumose-laminar, and feathery (Figs. 8–10). Secondary hairs of the plumose type may vary greatly in relative length, depending on their function, and they have repeatedly been confused with the other two types.

Plumose hairs are obviously the basic type in Araneomorpha and Theraphosomorpha. With the exception of the calamistrum hairs, there are no simple hairs in most of the main groups of Araneomorpha, and all their spines, bristles, and trichobothria are also of the plumose type. The great majority of Araneomorph spiders possess only plumose hairs.

The simple type of hairs is often also branched,

but these branches are fundamentally dissimilar in shape and insertion, and the term serrate is here applied to them. The simple type of hairs serve as an excellent key character for the superfamily Araneioidea (Araneidae, Theridiidae, Linyphiidae, etc.), but also originated independently in Hypochiloidea (Hypochilidae, Pholcidae, Scytodidae, Leptonetidae, etc.), and in the suborder Liphistiomorpha. In Segestriidae, there are both simple and plumose hairs, and as far as I know, this is unique in the whole order.

The feathery hairs as they are defined here have long branches growing horizontally on both sides of the hair. These hairs are always superficial in position, and often far more common on legs than on carapace and abdomen. Up till now, feathery hairs have been found in the following families, which are certainly not all related to each other: Sicariidae (Loxoscelinae), Thaididae, Dinopidae, Thomisidae, Miturgidae, Amaurobiidae, Liocranidae, Zoridae (*Hestimodema*), Agelenidae, Pisauridae, Oxyopidae, Homalonychidae, Senoculidae, and Uloboridae. A comparison with the evolution of other characters of these families suggests that they are primitive structures, independently reduced in the course of evolution, rather than results of convergent evolution.

Colulus. This structure is here defined as a nonfunctional homologue of the cribellum, not dependent on its size and shape. Although numerous families have been described as lacking a colulus, it is in fact very rarely lacking in Araneomorpha, but often greatly reduced in size. On the other hand, no traces of cribellar homologues can be found in Theraphosomorph spiders.

Spinnerets proper. The posterior spinnerets in Hickmanidae, Thaididae, Megadictynidae, and Eresidae are more or less modified. Sexual dimorphism in the length of posterior spinnerets is present at least in Amaurobiidae: Metaltellinae, and less markedly in Amaurobiidae: Macrobulinae.

A curious transversal fission of the median spinnerets has been described in dealing with the Eresid genera *Dresserus* and *Gandanameno*. Well-developed median spinnerets are confirmed to be present in Hadrotarsidae. Thus there are no spiders with only anterior and posterior, but no median spinnerets, as suggested by some authors.

The presence of a characteristic narrow chitinous ridge at the base of the anterior spinnerets is found to be regular in Sparassidae, but this structure also arose through convergence in some Ctenid spiders, at least.

Stridulatory organs. An entirely new type of stridulatory organ is described as a key-character for the Amaurobid subfamily Phyxelidinae. It consists of a row or triangular group of sinuous spurs at the base of the palpal femur. The palpus is evidently rubbed against the rugose basolateral face of the chelicerae. This organ is equally developed in both sexes.

In the male of the Macrobuline species *Pimus pitus* there is a row of short spines, which apparently also constitute a stridulatory organ, but the spines gradually taper away, and the structure is lacking in the female.

Calamistrum. The microstructure of the true calamistral hairs is entirely different from that of the surrounding hair covering. They are perfectly smooth and regularly curved, evidently by adaptation. It is impossible to tell whether the calamistrum of Hypochilidae has developed from a type of hairs similar to that of all other Cribellate groups. In other groups with the simple-serrate type of hairs, there are no recent Cribellate representatives.

The second row of the calamistrum in Amaurobiidae: Amaurobiinae consists of normal plumose hairs, arranged regularly on the margin of the adjacent area of dense hair covering.

In Miturgidae and in Cribellate representatives of Zoridae and Ctenidae, the calamistrum proper is entirely reduced, and the irregularly arranged calamistral hairs are all plumose. These analogous structures are here named pseudo-calamistrum.

Eye pattern. The taxonomic value of the relative size of the anterior median eyes has been stated to be insignificant in at least some groups of Amaurobioidea. This character is subject to geographic variation at least in *Lathys heterophthalma*, and to sexual dimorphism combined with allometric growth in *Exlinea rorulenta* (Amaurobiidae: Metaltellinae).

Adaptive hair pattern on legs. Until now, each of the terms scopula, claw-tuft, auxiliary claw, and trichobothrium has been variously interpreted. In this paper, the term scopula has

been used if the density of the ventral hair covering of the apical part of the legs differs considerably from the densities on the other parts of these segments. There is no clearcut difference between scopulate and nonscopulate type, but all intermediate types may be found within a single subfamily or family (Amaurobiidae, Liocranidae, Eresidae, Psecchiidae, etc.).

The same is true of the gradual variation in the claw-tufts. Both of the above-mentioned structures are correlated to the reduction of the unpaired tarsal claw. The intermediate phases of this reduction in some species that are here assigned to Miturgidae: Uliodoninae and in Zodariidae and Dysderidae have already been described. The present study has shown that dissimilar reduction in anterior and posterior pairs of legs is normal in the Miturgid subfamilies Machadoniinae and Uliodoninae.

Although the term trichobothrium has been generally used for a certain type of sensory hairs, these are of two fundamentally different types. The trichobothria proper originate at the bottom of a well-defined, cup-shaped depression, and their site is still clearly visible even after they have been removed. On the other hand, several groups of spiders have more or less regularly arranged erect hairs that are apparently analogous to the trichobothria proper, but their point of insertion does not essentially differ from that of a normal hair. In this paper, the descriptive term indistinct trichobothrium is applied to them.

Conductor. The term conductor has been given several different meanings by earlier authors, but it is here defined as the tegular process of variable shape and structure that acts as the primary support for the distal part of the embolus. It is usually impossible to show absolute homology between different superfamilies, and thus the term conductor refers to homological structures only in restricted groups.

In cases where the primary conductor of the group concerned has lost its function, the analogous structure is called the secondary conductor (some Amaurobioidea and Gnaphosoidea as well as in all Lycosoidea), unless it is a sclerite or a part of one that is generally named in another way. It is suggested that the secondary conductor of Amaurobioidea is an excellent key-character in this taxonomically difficult, exceptionally homogeneous group.

Median apophysis. This term refers in this paper to a well-defined sclerite of the male palpal bulbus that is joined to the tegulum by a membranous, movable joint. The homology of the median apophysis of Amaurobioidea and related superfamilies with that of other groups of Araneomorph spiders is uncertain. Within Amaurobioidea, the presence of a median apophysis is generally a useful family character, although in some lines of evolution in Amaurobiidae and Hahniidae this structure has been secondarily reduced.

Epigynal plate. The terms epigynal plate and lateral lobes have been repeatedly confused by earlier authors. Thus, e.g., the epigynal plate of the Amaurobid genera *Callobius* and *Callioplus* is small and unpaired, and their lateral lobes are large and well sclerotized. The term Haplogyne has been stated to be relative only, and there is no abrupt difference between unsclerotized and sclerotized epigynes.

Descriptive and revisional taxonomy

Following new species representing generotypes of new genera were described here:

Amaurobiidae:	Macrobuniinae	<i>Yupanquia schiapellii</i>	♀ Neotropical
		<i>Obatala armata</i>	♀ Ethiopian
Agelenidae:	Altellopsiinae	<i>Yacolla pikelini</i>	♀ Neotropical
		<i>Kidugua spiralis</i>	♀ Ethiopian
	Ageleninae	<i>Olorunia punctata</i>	♂ Ethiopian
		<i>Mashimo leleupi</i>	♀ Ethiopian
Dictynidae:	Dictyninae	<i>Tahuantina zapfei</i>	♂♀ Neotropical
		<i>Wajane armata</i>	♂ Ethiopian
Eresidae:	Penestominae		

Additional new species have been taken into account in determining the total range of corresponding genera, and they are referred to in the alphabetic list of genera without name and description.

The generic revision tends to standardize the principles of definition and limitation of genera in spiders. Therefore the creation of 61 new genera has been necessary, while numerous new generic synonyms have been found, and several cases in which the synonymy or limitation has been a matter of disagreement among earlier authors, have been treated according to standards generally accepted. Several obviously new genera have been left undescribed in expectation of additional information. For

quick reference, the new genera with previously described generotypes are listed below.

Filistatidae

<i>Andoharano</i> – <i>Filistata decaryi</i> Fage 1945	♂♀	Malagasy
<i>Kukulcania</i> – <i>F. hibernalis</i> Hentz 1842	♂♀	Neotropical
<i>Pritha</i> – <i>F. nana</i> Simon 1868	♂♀	Palearctic – Oriental – Australian
<i>Zaitunia</i> – <i>F. schmitzi</i> Kulczynski 1911	♂	Palearctic

Oecobiidae

<i>Ambika</i> – <i>Oecobius putus</i> O. Pickard-Cambridge 1876	♂♀	Palearctic – Ethiopian
<i>Maitreja</i> – <i>Oecobius marathaus</i> Tikader 1962	♀	Oriental
<i>Tarapaca</i> – <i>Oecobius nieborowski</i> Kulczynski 1909	♂♀	Neotropical

Miturgidae

<i>Devendra</i> – <i>Campostichomma pardale</i> Simon 1898	♂♀	Ethiopian
<i>Machadonia</i> – <i>Campostichomma robustum</i> Simon 1898	♂♀	Ethiopian

Amaurobiidae

<i>Arctobius</i> – <i>Amaurobius agelenoides</i> Emerton 1919	♂♀	Holarctic
<i>Baiami</i> – <i>Epimecinus volucripes</i> Simon 1908	♂♀	Australian
<i>Exlinea</i> – <i>Clubiona rorulenta</i> Nicolet 1849	♂♀	Neotropical
<i>Forsterina</i> – <i>Aphyctoschaema cryphoeiciformis</i> Simon 1908	♂♀	Australian
<i>Malaika</i> – <i>Auximus longipes</i> Purcell 1904	♂♀	Ethiopian – Malagasy
<i>Marplesia</i> – <i>Ixeuticus janus</i> Bryant 1935	♂♀	Australian
<i>Matundua</i> – <i>Auximus silvaticus</i> Purcell 1904	♂♀	Ethiopian
<i>Namandia</i> – <i>Rubrius periscelis</i> Simon 1903	♂	Australian
<i>Taira</i> – <i>Amaurobius flavidorsalis</i> Yaginuma 1964	♂♀	Palearctic
<i>Tamgrinia</i> – <i>Coelotes alveolifer</i> Schenkel 1936	♂♀	Palearctic
<i>Tjurunga</i> – <i>Rubrius paroculus</i> Simon 1903	♀	Australian
<i>Vidole</i> – <i>Amaurobius capensis</i> Pocock 1900	♂♀	Ethiopian
<i>Xevioso</i> – <i>Haemilla tuberculata</i> Lawrence 1939	♂♀	Ethiopian

Agelenidae

<i>Agelenella</i> – <i>Agelena pusilla</i> Pocock 1903	♀	Ethiopian
<i>Benoitia</i> – <i>A. bornemiszaei</i> Caporiacco 1947	♂♀	Ethiopian
<i>Maimuna</i> – <i>Textrix vestita</i> C. L. Koch 1841	♂♀	Palearctic – Ethiopian
<i>Mistaria</i> – <i>Agelena leucopyga</i> Pavesi 1884	♂♀	Ethiopian
<i>Tikaderia</i> – <i>Malthonica psechrina</i> Simon 1906	♀	Oriental

Dictynidae

<i>Arangina</i> – <i>Dictyna cornigera</i> Dalmas 1917	♂♀	Australian
<i>Banaidja</i> – <i>D. bifasciata</i> L. Koch 1872	♂♀	Australian

<i>Brigittea</i> – <i>Aranea latens</i> Fabricius 1775	♂♀	Palearctic – Oriental
<i>Hackmania</i> – <i>Argenna prominula</i> Tullgren 1948	♂♀	Holarctic
<i>Iviella</i> – <i>Argenna ohioensis</i> Chamberlin & Ivie 1935	♂♀	Nearctic
<i>Marilynia</i> – <i>Dictyna bicolor</i> Simon 1870	♂♀	Palearctic
<i>Mexittia</i> – <i>Lethia trivittata</i> Banks 1901	♂♀	Neotropical – Nearctic
<i>Nigma</i> – <i>Drassus flavescens</i> Walckenaer 1825	♂♀	Palearctic – Oriental
<i>Shango</i> – <i>Dictyna capicola</i> Strand 1909	♀	Ethiopian
<i>Sudesna</i> – <i>Dictyna hedinii</i> Schenkel 1936	♂♀	Palearctic – Oriental

Hahniidae

<i>Intihuatana</i> – <i>Bigois antarctica</i> Simon 1902	♂♀	Neotropical
<i>Unzickeria</i> – <i>Hahnia okefinokensis</i> Chamberlin & Ivie 1934	♂♀	Nearctic – Neotropical

Ctenidae

<i>Viracucha</i> – <i>Acanthoctenus andicola</i> Simon 1906	♂♀	Neotropical
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Zoridae

<i>Takeoa</i> – <i>Zoropsis nishimurai</i> Yaginuma 1963	♂♀	Palearctic
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Eresidae

<i>Gandanameno</i> – <i>Eresus spenceri</i> Pocock 1900	♂♀	Ethiopian
<i>Magunia</i> – <i>Stegodyphus tentoriicola</i> Purcell 1904	♂♀	Ethiopian

Titanoecidae

<i>Anuvinda</i> – <i>Titanoeca escheri</i> Reimoser 1934	♀	Oriental – Palearctic
<i>Pandava</i> – <i>Amaurobius laminatus</i> Thorell 1878	♂♀	Oriental – Australian

Uloboridae

<i>Astavakra</i> – <i>Uloborus sexmucronatus</i> Simon 1893	♀	Oriental
<i>Daramulunia</i> – <i>Uloborus gibbosus</i> L. Koch 1871	♂♀	Australian
<i>Huanacauria</i> – <i>Miagrammopes bambusicola</i> Simon 1892	♂♀	Neotropical
<i>Mumaia</i> – <i>M. corticeus</i> Simon 1892	♂♀	Neotropical – Nearctic
<i>Polenecia</i> – <i>Uloborus productus</i> Simon 1873	♂♀	Palearctic
<i>Purumitra</i> – <i>Uloborus grammicus</i> Simon 1893	♂	Oriental
<i>Ranguma</i> – <i>Miagrammopes similis</i> Kulczynski 1908	♂♀	Australian – Oriental
<i>Tangaroa</i> – <i>Uloborus tahitiensis</i> Berland 1934	♂♀	Australian

Some of these genera are quite rich in species, and characteristic of the spider fauna of their respective regions (*Brigittea*, *Forsterina*, *Gandanameno*, *Huanacauria*, *Machadonia*, *Mistaria*, *Pritha*, and *Viracucha*, at least).

The number of species is greatly reduced in the type genera of well-known families and subfamilies, when they are delimited to correspond to the standards accepted. This is easily explained, because authors in the different main regions have not often been personally acquainted with material from other regions, and because the definitions of classical genera have generally been obscure. The most fundamental redefinition and relimitation concern *Acanthoctenus*, *Agelena*, *Amaurobius*, *Cybaeus*, *Dictyna*, *Eresus*, *Filistata*, *Hahnia*, *Miagrammopes*, *Oecobius*, *Tetrrix*, *Titanoecca*, and *Uloborus*.

There are also several «dump genera», to which numerous species have been assigned according to a few characters that usually have only insignificant taxonomic value in the respective group. These genera are *Bigois*, *Campositichomma*, *Myro*, and *Rubrius*. Besides, there are some genera in this category, which have here been synonymized according to the status of the generotype, although most of their species belong elsewhere: *Auximus*, *Haemilla*, *Ixeuticus*, and *Aphyctoschaema*. The results of the revision of *Auximus* are quite surprising: its species are in fact scattered throughout most of the subfamilies of Amaurobioidea.

In the cases of *Aphyctoschaema*, *Epimecinus*, *Sybota*, and *Tetrilus*, the generally accepted concepts of definition proved erroneous as the generotypes were not well-known.

The limitation of the following little-known genera, up till now usually catalogued as monotypic, has been considerably widened: *Ajmonia*, *Alistra*, *Anaxibia*, *Archaeodictyna*, *Auximella*, *Dictynomorpha*, *Metaltella*, *Muizenbergia*, *Nurscia*, *Phyxelida*, and *Retiro*. The limitation of *Badumna* and *Coelotes* has also been considerably widened, as has that of the following genera which have long been regarded as synonymous with other genera: *Goeldia*, *Phantyna*, *Philoponella*, *Thalamia*, and *Zosis*.

The generotypes of *Gephyroctenus*, *Nothroctenus*, *Paracanthais*, and *Thaïda*, as well as the species *Agroeca oswaldi* Lenz and *Nothroctenus bahiensis* M.-Leit. have been stated to be Cribellate spiders. On the other hand, *Acanthoctenus hingstoni* M.-Leit., *A. rubrolaeniatu*s M.-Leit., *Dictyna chandrai* Tikad. and the generotypes of

Arushina and *Hoplolathys* have been transferred to totally Ecribellate groups of spiders. The discovery of an Ecribellate Eresid species, *Wajane armata* gen. n., sp. n., is also worth mentioning here.

Phylogenetic classification of Araneomorpha

Different groups of Araneomorpha have been classified here with varying degrees of accuracy, and therefore neither a final list of superfamilies nor a final limitation of many families has been presented. The confirmed results of the classification at and above family level are as follows.

Cribellata and *Ecribellata*. These group names are widely used and convenient, but they do not refer to taxonomic categories. In the ancestors of all the Araneomorph spiders the cribellum was homologous with the anterior median spinnerets, and has been independently reduced in numerous lines of spider evolution. This reduction is still in process in several recent groups, and it can be most easily traced in several Neotropical and Australian groups of Amaurobiidae, as well as in the Ctenid subfamily Acanthocteninae. Thus the presence or absence of the cribellum as such cannot be used in the limitation of families or even subfamilies, and in some cases both Ecribellate and Cribellate species must be included in a single genus (*Macrobunus* and probably *Nothroctenus*).

Primitive Araneomorpha. The classical group Haplogynae has been stated to be primitive only as regards the evolution of genital and, in some cases, respiratory organs. Most probably the sclerotization of the external epigyne and the complication of the male palpal organs have occurred in several different lineages.

The primitive Cribellate genera *Hypochilus*, *Ectatosticta*, *Hickmania*, and *Thaïda* (= *Austrochilus*), have been considered as representing the only living remnants of their respective families. Moreover, none of the four is closely related to any of the others, although probable Ecribellate derivatives are shown for *Hypochilus* and *Hickmania*. An additional primitive Cribellate family is created for the New Zealandian genus *Megadictyna*, which is grouped closest to *Thaïda*. Filistatidae has also been listed

among the above-mentioned primitive families, which, together with several Ecribellate families, constitute the first main branches of spider evolution, Filistatides and Thaidides. However, Filistatidae is quite an advanced group in several respects, as are also the Ecribellate families Caponiidae, Oonopidae, Pholcidae, and to a less extent, many other groups of Haplogyne spiders.

Main groups of Entelegyne spiders. The most difficult problem in the present work has been the division of the classical artificial group of Entelegynae into monophyletic subdivisions, and at least some details of the results presented here must be taken with reservations.

Four groups above the superfamily level are suggested – Oecobiides, Amaurobiides, Zodariides, and Araneides, but the monophyly of Zodariides remains doubtful, and the placing of some families remains open (Dinopidae, Prodidomidae, Aebutinae). On the other hand, I regard my classification of the large branch Amaurobiides as rather close to the true phylogenetic schema, although it is in this very case that my results most strikingly disagree with all previous systems. Since the limitation of Archaeidae has been excepted, the branch Araneides conforms to the views of most of the previous authors that have discussed this topic. Neither is the content of Oecobiides fundamentally different from that already presented by some other authors.

Relimitation of classical families. The present revisional work has shown that some of the classical families are undoubtedly polyphyletic. This is especially true of the homogeneous group Amaurobioidea. The most radical changes are listed below.

Agelenidae auct. is a mere assemblage of three-clawed Entelegyne spiders with unmodified eye pattern, carapace, and abdomen, and with reduced cribellum (= colulus). These spiders are scattered here in various families of Amaurobioidea (cf. Fig. 11), while a few of them have had to be transferred to quite another branches. The complicated structure of both male and female genital organs has been the most useful character complex in the phylogenetic analysis of this group, but, e.g., an analysis of the structure of the colulus as such leads to identical classification.

My Agelenidae includes the genera that have been grouped around the classical genera *Agelena*, *Tegenaria*, *Tetrax*, and *Coelotes*. The three first-named groups are regarded here as tribes, while Coelotinae has been accepted as a subfamily of its own. The named tribes could probably be treated as subfamilies as well, but the limitation of them remains partly uncertain.

True Agelenid spiders are characterized by the presence of paired colulus, usually abundant feathery hairs, lengthened posterior spinnerets, and a dorsal pattern of *Agelena* type. The primary conductor acts as a functional conductor in the male palpus, and the secondary conductor, as defined in this paper, is always lacking. However, only the presence of paired colulus is available as a true key-character among three-clawed spiders.

Clubionidae auct. is likewise a mere assemblage of two-clawed genera with other characters unmodified as in Agelenidae auct. above. These spiders in fact belong to several different superfamilies, and even the limitation of subfamilies and tribes as listed in ROEWER's «Katalog der Araneae» is largely incorrect. The subfamily Corinninae auct. has been rather well limited by most recent authors, although several genera from other «Clubionine» groups must be transferred to Corinnidae. It is here raised to family rank and removed to the vicinity of Zodariidae. Liocranidae is another independent family, which can be easily derived from Amaurobioidea through reduction of the unpaired tarsal claw. However, the genera of Liocranidae were formerly scattered among various «Clubionine» groups. Nor is ROEWER's Liocraninae identical with the present family. The group Miturgae auct. approximately corresponds to my subfamily Miturginae in Miturgidae, while the representatives of my subfamily Eutichurinae of the same family were formerly listed mainly in Clubioninae. I have further transferred Myandrinae into Prodidomidae and Cybaeodinae to the vicinity of Zodariidae. Liocraninae: Phrurolitheae auct. and Micariinae: Micariae auct. together approximately correspond to my Gnaphosid subfamily Micariinae, while some other genera have been transferred to Anagraphinae. The position of some «Clubionine» genera has remained obscure, e.g. that of Malagasy *Carteronius*.

There are only a few genera that are certainly

related to the type genus *Clubiona*, although this genus must be split, as recently proposed by some authors. Another «supergenus», *Chiracanthium*, should probably be included in Clubionidae, but it is not closely related to *Clubiona*. The final place of my Clubionidae in a phylogenetic classification remains uncertain.

Amaurobiidae auct. has included practically all the large and medium-sized Cribellate relatives of Agelenidae. Here some of these genera have been transferred into Miturgidae and Dictynidae, while my Amaurobiidae includes several dozens of genera that have been earlier listed in Agelenidae, Pisauridae, and other Cribellate families such as Psecridae, Tenggellidae, and Dictynidae.

Hahniidae auct. is generally defined according to the curious pattern of spinnerets that are inserted in a practically horizontal row. In fact, this is only a general trend in this family, and its gradual development can be traced in several lineages.

Spiders with an almost normal spinneret pattern have also been included in Hahniidae, to constitute the subfamilies Cryphoecinae and Cybaeolinae. My Hahniidae is characterized by a trend towards the reduction of the median apophysis and the primary conductor of the male palpus. A cymbial furrow usually receives the function of conductor, and no secondary conductor is developed.

Dictynidae auct. The small and minute Cribellate relatives of Amaurobiidae have been included in this family by most earlier authors, because a general trend towards reduction of the tarsal trichobothria is correlated to the decrease in size. In fact, the families Amaurobiidae and Dictynidae have been profoundly confused.

My Dictynidae also includes two totally Ecribellate subfamilies, Cybaeinae and Litisedinae, while the bulk of my Cicurinine genera is also Ecribellate, as are also two genera of Tricholathysinae. All these groups have very similar genital organs, nor is the evolution of any other character in conflict with the supposed phylogeny of my Dictynidae.

All representatives of my Dictynidae lack the median apophysis, while the primary conductor is more or less caudally pointed.

Ctenidae auct. includes only two-clawed Ecribellate spiders with the typical eye pattern

and general appearance. The representatives of Zoropsidae auct. and Acanthoctenidae auct., both consisting merely of Cribellate species, I have scattered throughout Ctenidae, but the Zoropsid subfamily Zorocratinae auct. has been transferred to Miturgidae. On the other hand, numerous Ecribellate genera from Ctenidae auct., together with *Zoropsis*, had to be transferred to my Zoridae; the limitation of the latter family is radically widened, and it also includes several genera from Pisauridae: Thaumasiinae auct. A few «Ctenid» genera have been transferred to other families, e.g., Miturgidae.

Pisauridae auct. has usually been defined as intermediate between Agelenidae and Lycosidae, that is, neither the two-row eye pattern nor the 4 + 2 + 2 pattern of Lycosidae can be traced distinctly in them. In fact, the three classical subfamilies of Pisauridae have not even a similar eye pattern. Most species of Thaumasiinae auct. are regarded to constitute my Dolomedidae, which must be placed in Lycosoidea because of the fundamentally similar pattern of the genital organs.

My Pisauridae is characterized by the lack of secondary conductor, abundance of feathery hairs, and by a pattern of *Pisaura* – *Oxyopes* type. My Pisauroida also includes Oxyopidae, Homalonychidae, and Senoculidae.

Toxopidae has been limited here according to the original description, while the other genera of FORSTER's Toxopidae are distributed among several families of Lycosoidea or transferred to families related to Zodariidae.

Archaeidae auct. has previously been defined according to the bizarre modifications of the cephalic area. These have been proved to be due merely to convergence, and the genera with plumose hairs have been transferred close to Zodariidae, to constitute the family Mecysmaucheniidae.

My Archaeids are characterized by simple hairs, lack of cheliceral condyle, and especially by their habits which resemble those of Mimetids. They undoubtedly belong to the superfamily Araneoidea.

Psecridae auct. has been the subject of the most contradictory diagnosis both as a family and in its subdivisions. Stiphidiinae and Matachiinae auct. are here transferred to Amaurobiidae and they are also radically relimited.

The Oecobiidae of most authors has included only Cribellate genera, but I support the opinion that Urocteinae is a subfamily of Oecobiidae.

Several minor changes are suggested for the limitation of other families, and the current subfamilial division of many previously well-limited families has been proved to be arbitrary, e.g., in Salticidae.

New families. The standardization of the family concept has necessitated the creation of seven large families – Miturgidae, Liocranidae, Dolomedidae, Corinnidae, Titanoecidae, Cycloctenidae, and Mecysmaucheniidae, as well as the monotypic families Ectatostictidae, Hickmanidae, Thaididae, Megadictynidae, and Bradystichidae. Besides, there are probably some monotypic families in Haplogynae and in the branch Zodariides.

At the same time the families Tengellidae, Zoropsidae, Acanthothenidae, Amaurobioididae, Telemidae, and Urocteidae are annulled.

Superfamilies. The phylogenetically well-known groups are further grouped into superfamilies.

Among the most primitive branch of Araneomorph spiders, Hypochilidae, Scytodidae, Pholcidae, Leptonetidae, and Ochyroceratidae constitute what is certainly a natural group, Hypochiloidea. The affinities of other Haplogyne spiders remain at least partly unsolved.

The branch Amaurobiides, with the probable exception of the most advanced derivative groups, is by far the best-known major group of spiders in regard to mutual relations (see Fig. 11 on p. 313). There are three large and compact superfamilies – Amaurobioidea, Lycosoidea, and Pisauroidea, while the inclusion of Gnaphosoidea (Gnaphosidae, Platoridae, and probably Prodidomidae) and Sparassoidea (Sparassidae and Clubionidae) in Amaurobiides is highly probable, too. Besides, Anyphaenidae, Psecridae, Toxopidae, and Titanoecidae are here regarded as separate derivative branches of Amaurobiides.

Amaurobioidea consists of Miturgidae, Amaurobiidae, Liocranidae, Agelenidae, Dictynidae, and Hahniidae.

My Lycosoidea includes Lycosidae, Dolomedidae, Cycloctenidae, Zoridae, Ctenidae, and Selenopidae. The large family Lycosidae has not been revised here, while the other families have been studied less thoroughly than representatives of Amaurobioidea. The superfamily

Lycosoidea is characterized by the presence of a secondary conductor and modification of the eye pattern.

Uloboridae consists of four subfamilies, Uloborinae, Tangaroinae, Hyptiotinae, and Miagrammopinae, but it is only a matter of opinion whether the two former taken together and the two latter taken together constitute true families (Uloboridae and Miagrammopidae). If so, the whole group could be called Uloboroidea. It is obviously related to the well-known superfamily Araneoidea, although the presence of plumose hairs in Uloboroidea is an absolute key-character.

My Araneoidea is practically identical with that of LEVI & LEVI (1962), and consists of Araneidae, Tetragnathidae, Linyphiidae, Archaedidae, Mimetidae, Symphytognathidae, and Theridiidae. The separation of the two last families from each other seems to be difficult. Theridiosomatinae and Nesticinae are here included as subfamilies in Araneidae and Linyphiidae respectively. Erigonidae auct. is provisionally included in Linyphiidae, but most probably this complex could be more naturally subdivided in another way.

The relations of the rest of the families are not sufficiently well-known for them to be arranged in superfamilies comparable to those listed above, but the possible relations of most of them have been preliminarily discussed in this paper.

The course of Araneomorph evolution

Araneomorph evolution is characterized by some general trends – the disappearance of external and internal segmentation, adaptation to hunting habits, and increased complexity of the genital organs.

The two first trends entail structural reduction of various characters without simultaneous development of any complicated structures. Thus the correct interpretation of the possibility of independent reduction in different lineages is the basic problem in the study of spider evolution. However, the number of characters that undergo this reduction is great, and when the principle of general irreversibility of evolution is taken into account, as well as the independent evolution of most of the characters that are not affected by the same process of adaptation, a reliable cladogram of the whole suborder can be compiled branch by branch.

The principle of relative irreversibility is not accepted here, as a secondary function may reverse the trend towards reduction of an unused structure. However, the secondary development of any structure that has been totally reduced in the course of evolution is highly improbable.

Structural reduction. Patterns of structural reduction in spiders agree well with the hypothesis that the reduction of an organ is not anticipated to proceed once its primary function has ceased, and since the size of the vestige does not as such have any negative selective value. In other words, there is no mere trend towards a complete reduction, and when the reduction does proceed, there must be an explanation other than a teleological one, e.g., through various genetic mechanisms. As there are no external segmental sclerites in Araneomorpha, the disappearance of segmentation is demonstrated by the development of pseudo-segmental abdominal patterns, and reduction of some of the segmentally arranged respiratory organs or spinnerets. In anatomical characters, the reduction of a number of dorsoventral muscles and cardiac ostiae constitute excellent character by which to compile details of spider lineages. Other useful characters for this purpose are the disappearance of the segmentation of the longitudinal musculature and the arrangement of abdominal ganglions. The latter character is known only in a few spiders, but all data available for the other characters mentioned have been used for argumentation of the cladograms presented.

The adaptation to hunting habits is usually correlated with the reduction of the unpaired tarsal claw. The reduction of spinnerets is also a natural consequence of this trend, but usually it is restricted to the reduction of some types of spinning glands, as the spinning habits are usually preserved for building a tube for living in, or at least for protecting the eggs.

The reduction of several characters may also be correlated with the general reduction in size. These characters are, e.g., the posterior respiratory organs, the spines and trichobothria of the legs, the thoracic fovea in the carapace, etc. The presence and absence of all these characters have been repeatedly used as key-characters in previous classifications of spiders, although they are all distinctly phenetic.

Adaptation. The occupation of an entirely new ecological niche by several different groups of spiders always leads to complicated patterns of convergence, which often profoundly confuse the normal procedure of classification according to characters affecting the general appearance.

An excellent instance of this is the adaptation to submerged life of five different groups of the superfamily Amaurobioidea: Miturgidae Amaurobioidinae, Amaurobiidae Desinae, Dictynidae Argyronetinae and Litisidinae, as well as of the single Tricholathysine genus, *Mizaga*. All these have structural characters most of which are strongly affected by this exceptional adaptation, and the application of, e.g., the principles of numerical taxonomy would lead to grouping all of them together. Only the presence of nonadaptive characters makes it possible to study their relationship to terrestrial representatives of Amaurobioidea.

In my opinion, the evolution of the genital organs of spiders is usually nonadaptive, and yet directed by well-defined trends. In any case, the evolution of the genital organs in these five groups is not correlated to submerged life, as copulation never occurs in water.

Correlated problems of adaptation are common in the study of spider evolution, although the total influence on general appearance is usually less, e.g., in adaptation to life in caves, subterranean tubes, rock beds, vertical walls, etc.

Nonadaptive characters. As stated above, the evolution of the genital organs in spiders seems to be typically nonadaptive, and thus these organs constitute an excellent aid to phylogenetic analysis in all cases in which structural reduction or excessive adaptation has confused the information obtained from other characters. On the other hand, the problem of homology sometimes makes it difficult to reach a reliable conclusion based on these characters only. Besides, the analysis of genital characters is regularly possible only by personal investigation of the material of both sexes, as the figures available are always explicitly intended for identification only, and the figuration of a male palpus for purposes of phylogenetic analysis would often provide numerous figures from different angles, supplied with detailed explanations of the homologies of invisible central parts.

Zoogeography

The present revision undoubtedly proves that, contrary to the general belief, world-wide genera in spiders are as rare as in any group of cryptic animals of corresponding or larger size.

In the groups revised here in detail, there are only a few nearly cosmopolitan species resulting from a synanthropic mode of distribution. The best known are *Tegenaria domestica* and *Thalamia annulipes*.

Most of the genera and species studied are restricted to one, or at most two, of the main regions, if the Palearctic and Nearctic regions are regarded as constituting a single main region, the Holarctic. Some families, such as Amaurobiidae, Dictynidae, and Hahniidae, are world-wide, while most of the families that are thoroughly revised here occur in only two or three of the main regions, or in the tropics. The distribution of families and subfamilies is also summarized in considerably generalized maps (Figs. 517–524).

The total range of a cryptic group seems to be much smaller than that of a corresponding group living in the vegetation zone. All the genera with an exceptionally large total range belong to this kind of niche – *Dinopis*, *Uloborus*, *Philoponella*, *Emblina*, *Stegodyphus*, etc., or to semimarine habitats – *Desis* and *Amaurobioides*.

The Australian region is characterized by the presence of numerous special groups that are practically endemic: Amaurobiidae: Matachiinae and Stiphidiinae, Hickmanidae, Megadictynidae, Cycloctenidae, Toxopidae, and several families that are not discussed here in detail.

The Ethiopian region also has some characteristic groups – Eresidae, Amaurobiidae Phyxellidinae, Miturgidae Machadoniinae – but several Palearctic groups are well represented, too. The presence of some representatives of the mainly Neotropical Amaurobid subfamily Macrobuninae in South Africa is also worth mentioning here.

The spider fauna of Madagascar is not well-known, especially with regard to the groups revised in this paper. The presence of the giant Miturgids and true Archaeids is worthy of note, as well as the probable absence of Dictynidae, Eresidae, and Agelenidae, all of these being

abundant in adjacent parts of the Ethiopian region.

The fewest conclusions of this kind can be drawn from our knowledge of the Oriental region, but its eastern parts are strongly affected by the Australian spider fauna, and the western parts by the Palearctic and even the Ethiopian fauna. However, Psecchids and especially the primitive Liphistids as well as the single Ectatostictid species are concentrated in the Oriental region.

The Neotropical region is characterized by several more or less endemic groups of Amaurobioidea: the Amaurobid subfamilies Macrobuninae, Altellopsinae, Rhoicininae, and Metaltellinae, the Miturgid subfamilies Tengellinae and Eutichurinae, as well as the archaic Cribellate genus *Thaïda* is also found here. The northern part of the Neotropical region also has numerous species of typically Nearctic genera.

The eastern parts of the Nearctic region are strikingly similar to the Palearctic in composition of spider fauna. The only exception is found in the family Hypochilidae, which is totally Nearctic.

The area of the Rocky mountains is richer in spider families, and there are also several more or less endemic groups, such as Homalonychidae, Plectreuridae, and Diguettidae, in addition to much more numerous species of the wide-spread groups of Amaurobioidea, at least.

Over a large area of the Palearctic region the spider fauna is as monotonous as any other. However, large areas of Asia remain quite insufficiently explored, and the surprising discovery by myself of a representative of the Amaurobid subfamily Macrobuninae in Finnish Lapland shows that new groups are even to be expected in Europe, not to speak of Siberia and the adjacent areas.

Neither the zoogeography of the Cribellate spiders and their derivatives, nor the distribution of spiders in general as far as this is known today, suggests any new ideas, but rather bears out the theories based on the investigation of other groups of animals, better known also as regards taxonomy and phylogeny.

Summary

The present study deals with various aspects of modern arachnology, but they have not been studied with equal thoroughness.

As to the groups studied, the suborders Theraphosomorpha and Liphistiomorpha have been discussed only in connection with some general problems of spider evolution. Representatives of all groups of Araneomorpha spiders have been personally examined by me, but a thorough taxonomic revision is presented here only for the Cribellate groups and for Agelenidae auct. Families that are here regarded as close derivatives of some of the Cribellate groups have been at least relimited, and when possible more or less generically revised.

The phylogenetic relationships of various groups constituting the largely polyphyletic classical family Clubionidae have also been discussed in detail, although no complete generic revision has been made of them.

Many other families have also been radically relimited, and their taxonomic relationships are discussed.

The evolution of spiders has been thoroughly analyzed, and patterns of evolution characteristic of this group have been described, although a detailed description of the evolution of all characters studied has not been given. However, a large amount of information derived from such an analysis has been used in compiling the classification presented.

Generic and familial revision of the groups treated constitutes the bulk of the results presented here. The limitation and definition of these two taxa has been standardized, and monophylety has been chosen as the primary criterion of any taxon. Revisional work has been based on type material as far as possible, and material from 54 different museums all over the world has been available. A considerable amount of other than type material has also been kindly supplied by my colleagues.

Although the aim of this study has been a final classification of Araneomorpha, some of the results are incomplete.

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has also been obtained as gifts or in exchange. At a rather late phase of printing, a visit to some of the largest American museums made it possible to check some type material, but most of the information acquired then could not be included here. The complete names of the museums concerned and of the other scientific institutions are listed on pp. 207–208, and only the corresponding cities are mentioned here.

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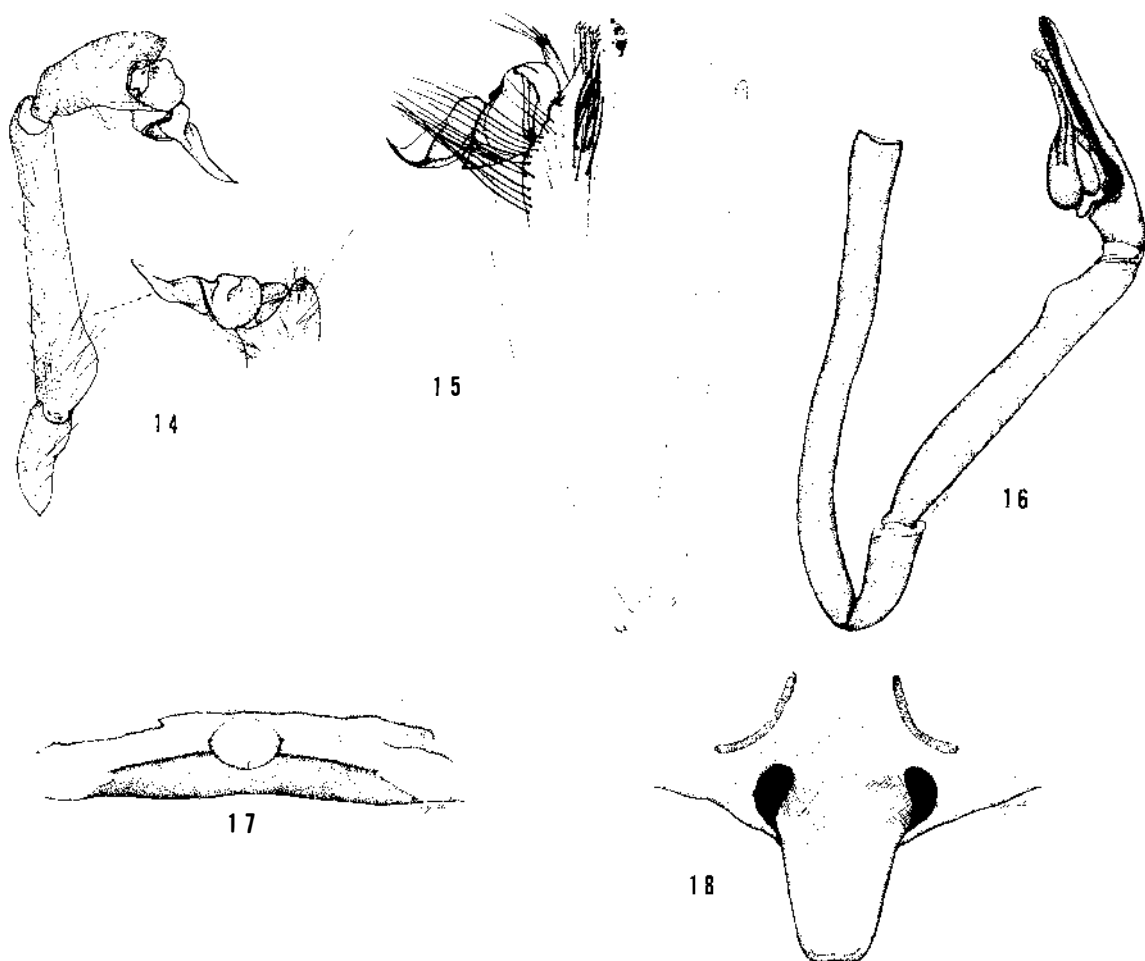
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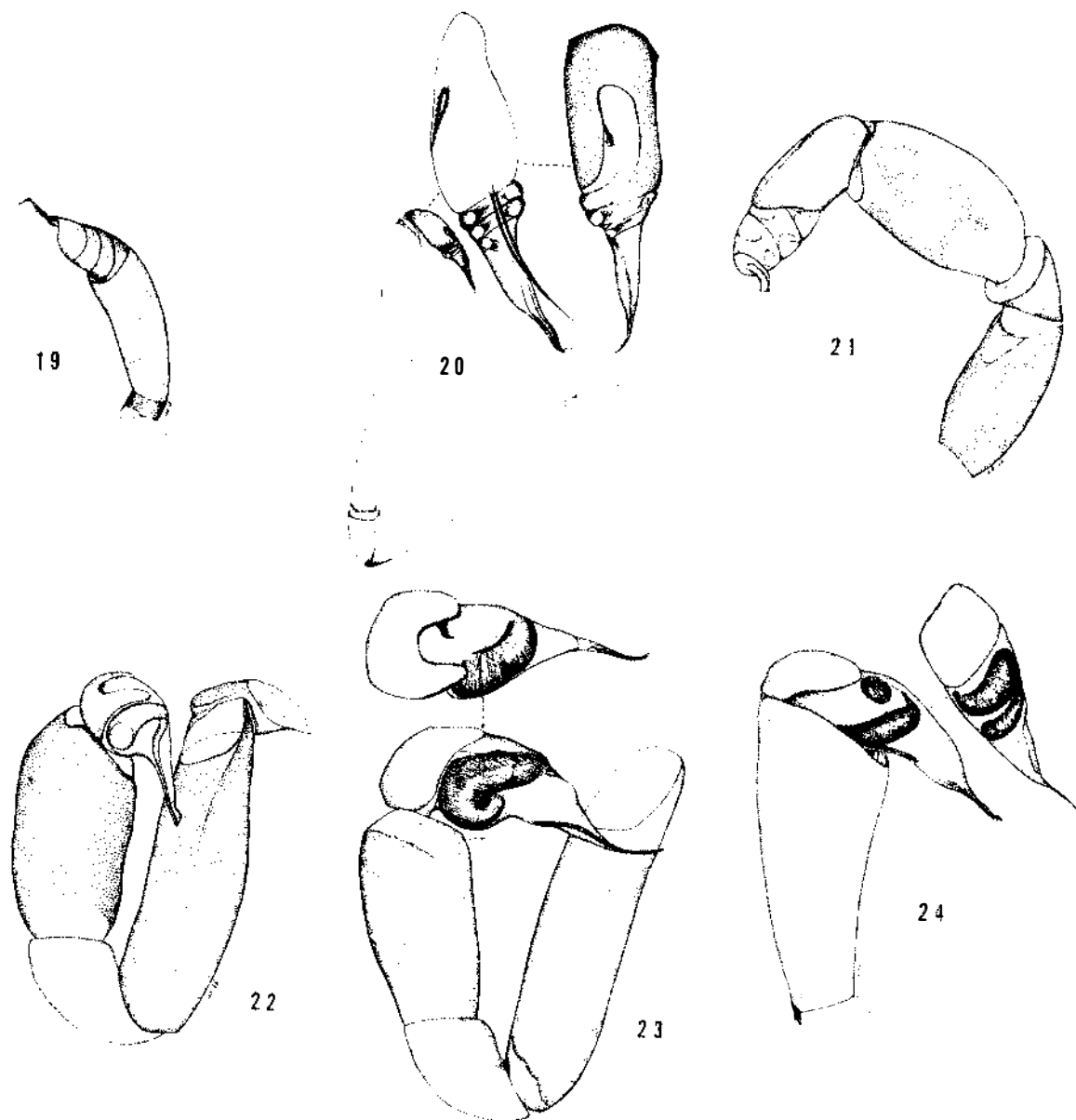
Figures 14 - 524

For the abbreviations used in the legends of the figures, see list of abbreviations on page 295. The names of the authors of each species are

mentioned under the genus in question in the alphabetical list of the genera revised (Chapter III).



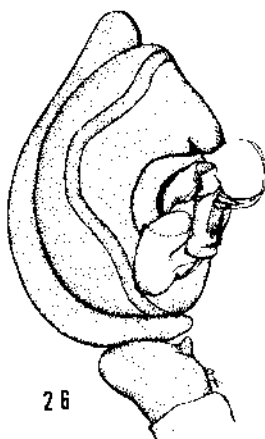
Figs. 14 - 18. - 14: *Hypochilus petrunkevitchi* ♂-p, 15: *Ectatosticta davidi* ♂-p, 16: *Hickmania troglodytes* ♂-p, 17: *Thaïda peculiaris* ♀-e, 18: *Megadictyna thileni* ♀-e. - Orig.



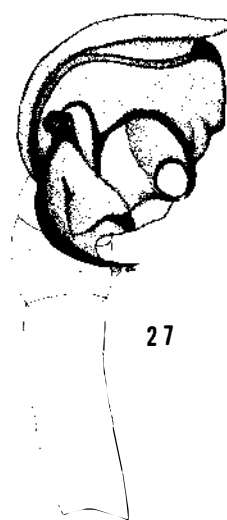
Figs. 19–24. – 19: *Kukulcania hibernalis* ♂-p, 20: *Filistata insidiatrix* ♂-p, 21: *Zaitunia schmitzi* ♂-p, 22: *Pritha nana* ♂-p, 23: *Pritha garciai* ♂-p (type of *Filistata pulchella*), 24: *Andoharano grandidieri* ♂-p.



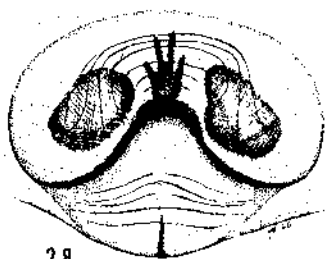
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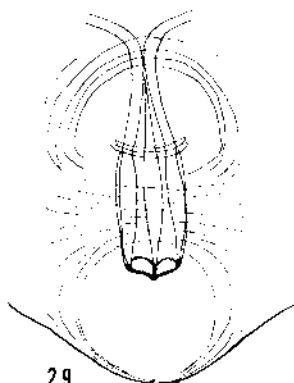
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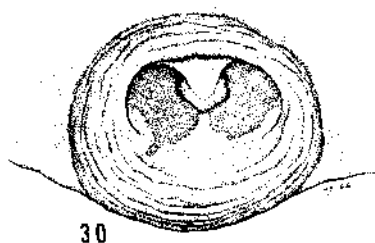
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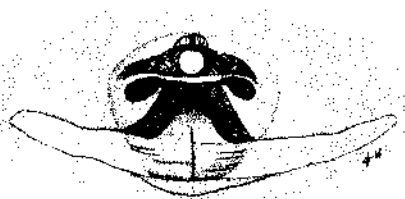
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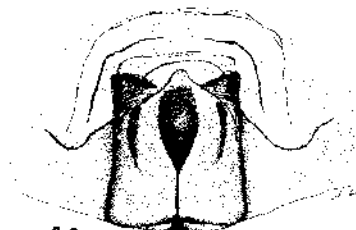
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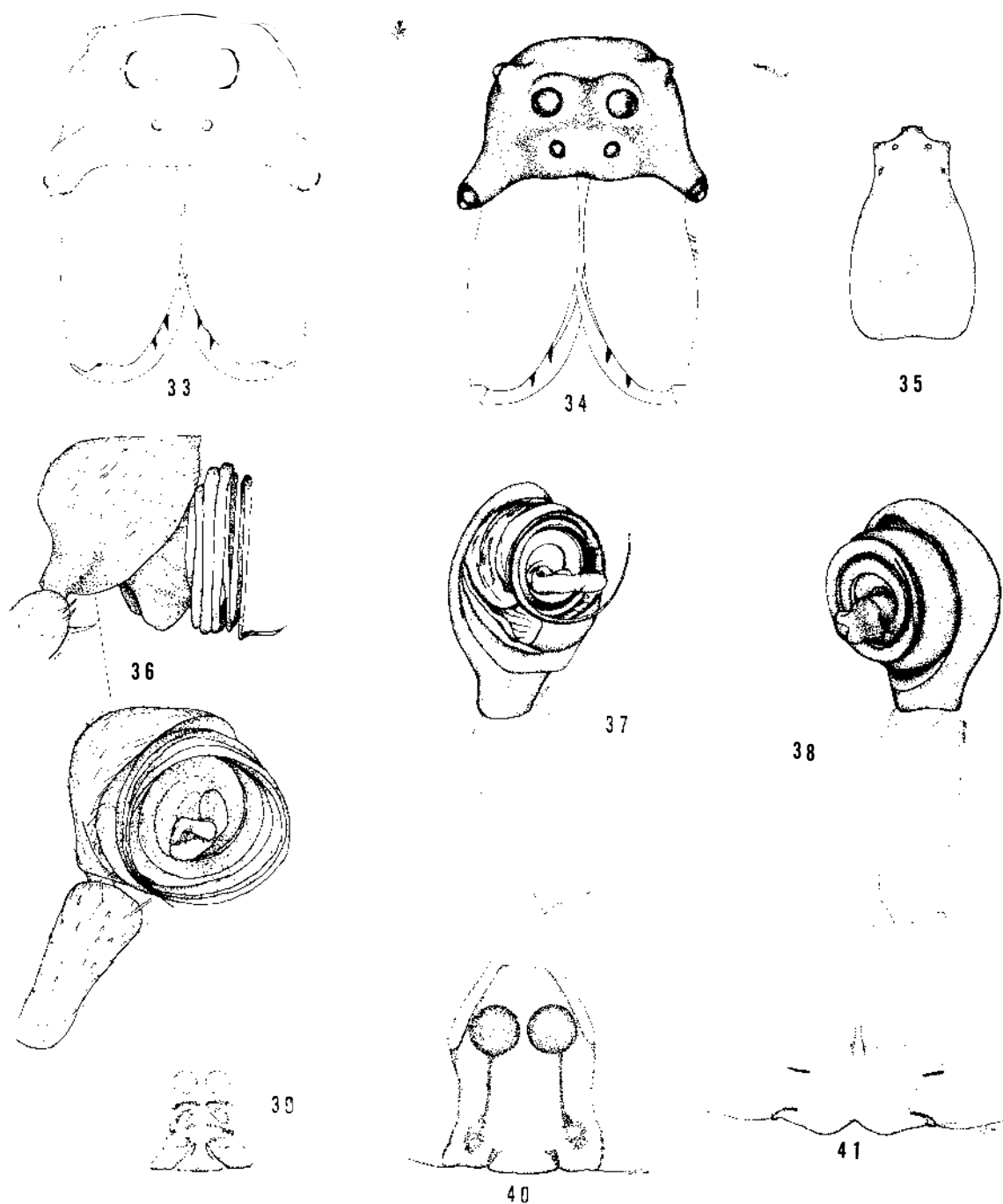


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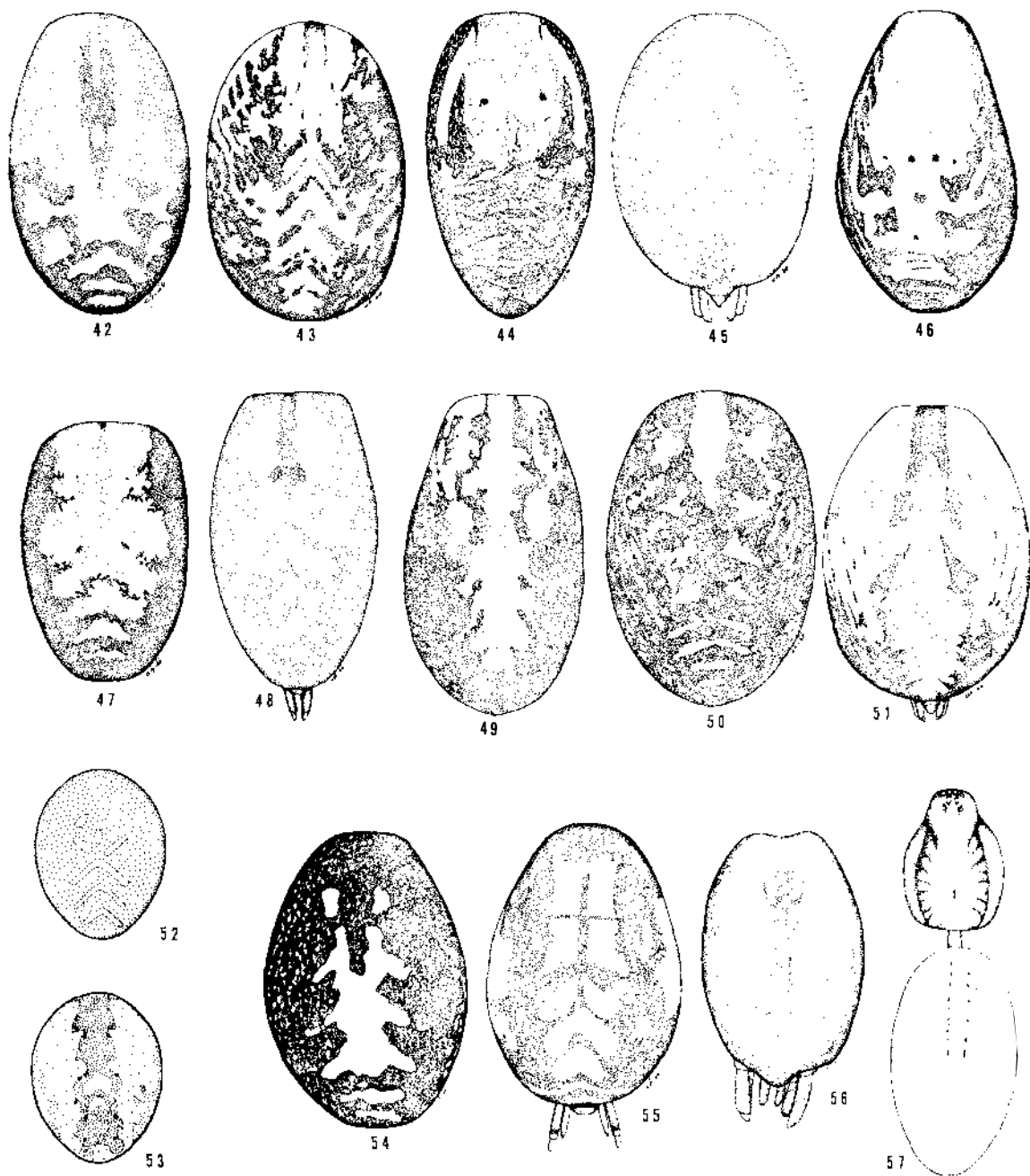


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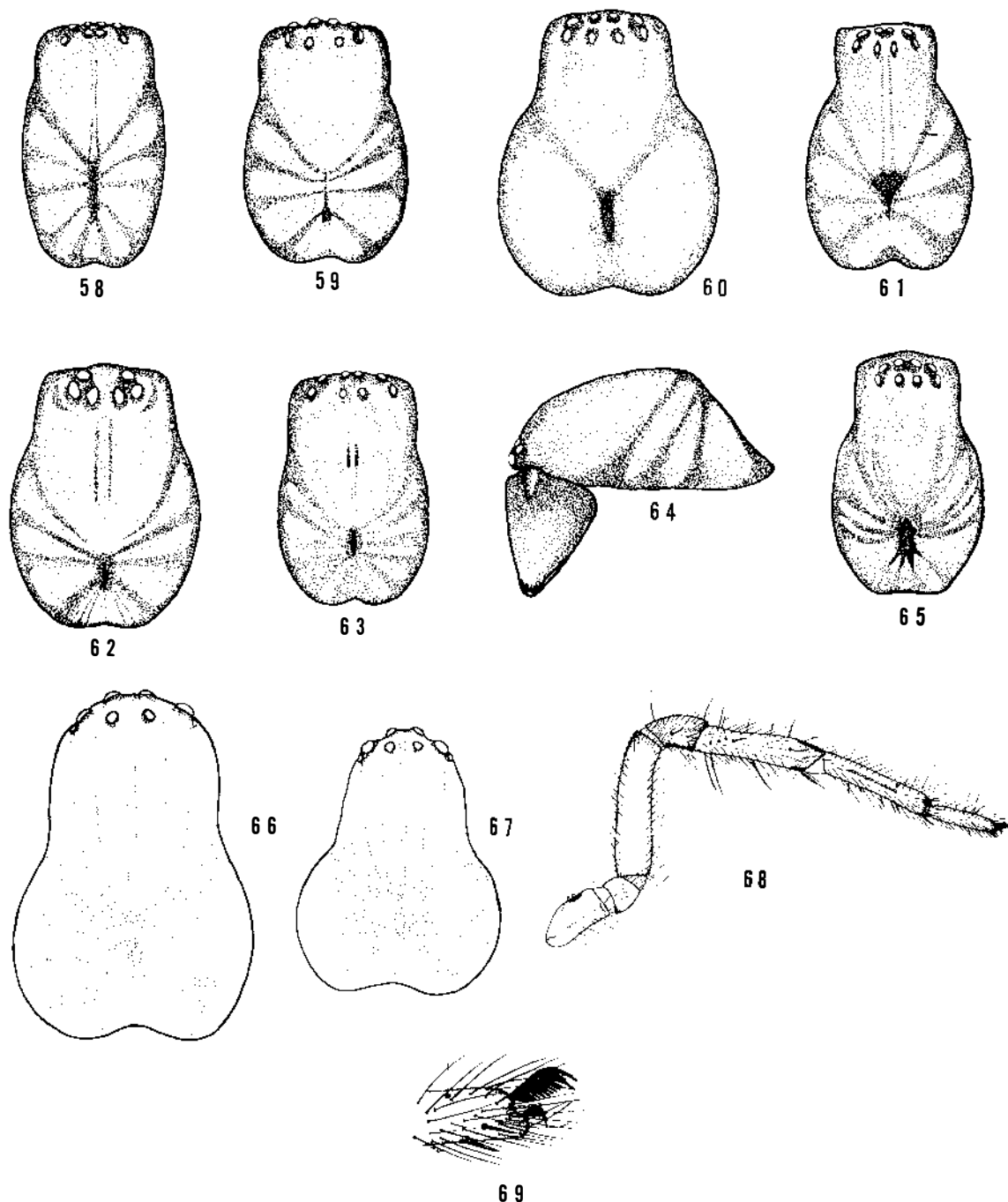
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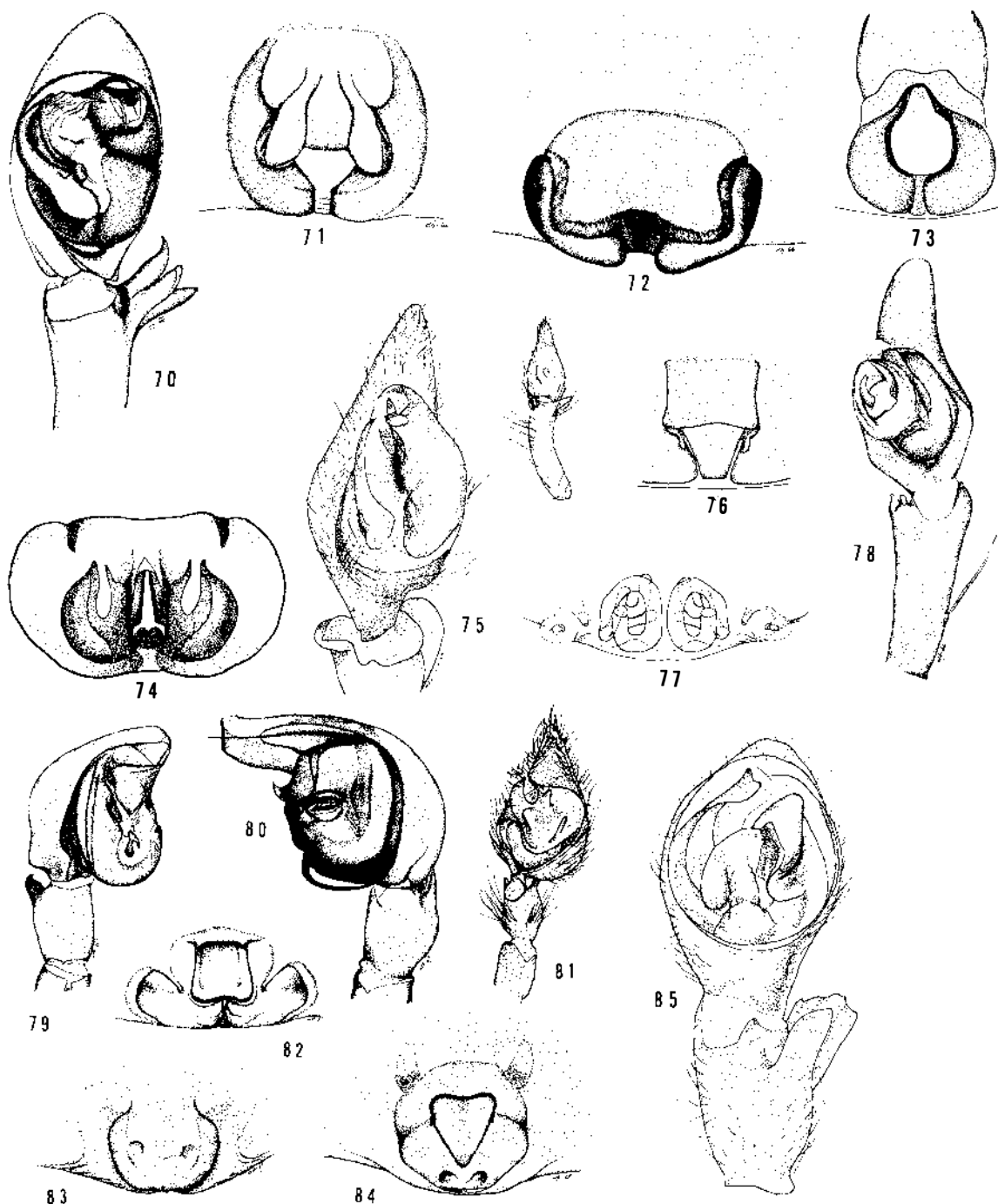
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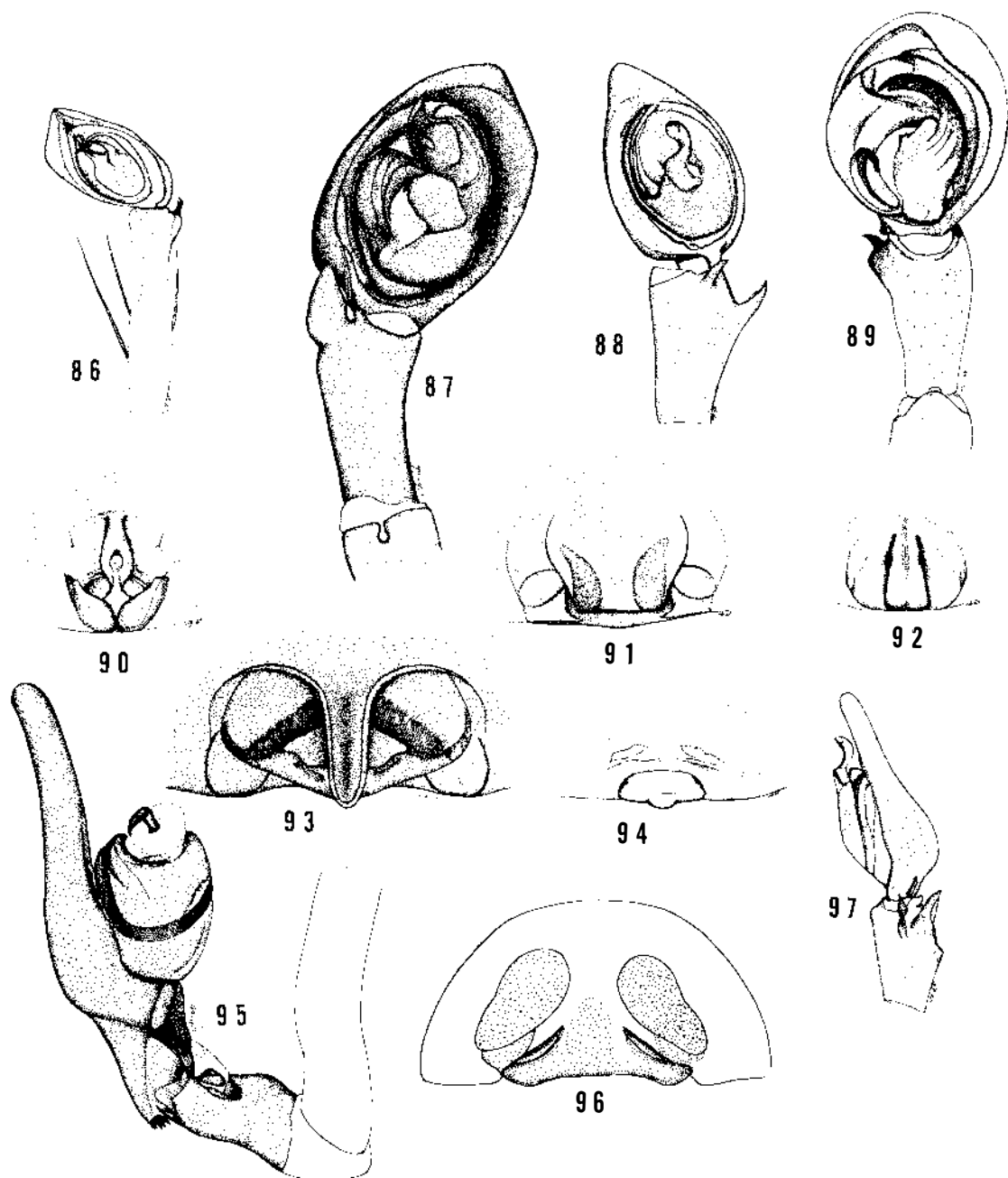
Figs. 42 – 57. – Dorsal pattern of some species. – 42: *Badumna hirsuta*, 43: *Oramia chathamensis*, 44: *Porteria albopunctata*, 45: *Retiro quitensis*, 46: *Rubrius antarcticus*, 47: *Callobius claustrarius*, 48: *Liocranum rupicola*, 49: *Tegenaria ferruginea*, 50: *Cybaeus reticulatus*, 51: *Lathys affinis*, 52: *Argenna patula*, 53: *Dictyna arundinacea*, 54: *Cryphoea silvicola*, 55: *Muizenbergia schubotzi*, 56: *Scolospilus bicolor*, 57: *Odo bruchi*. – Orig.



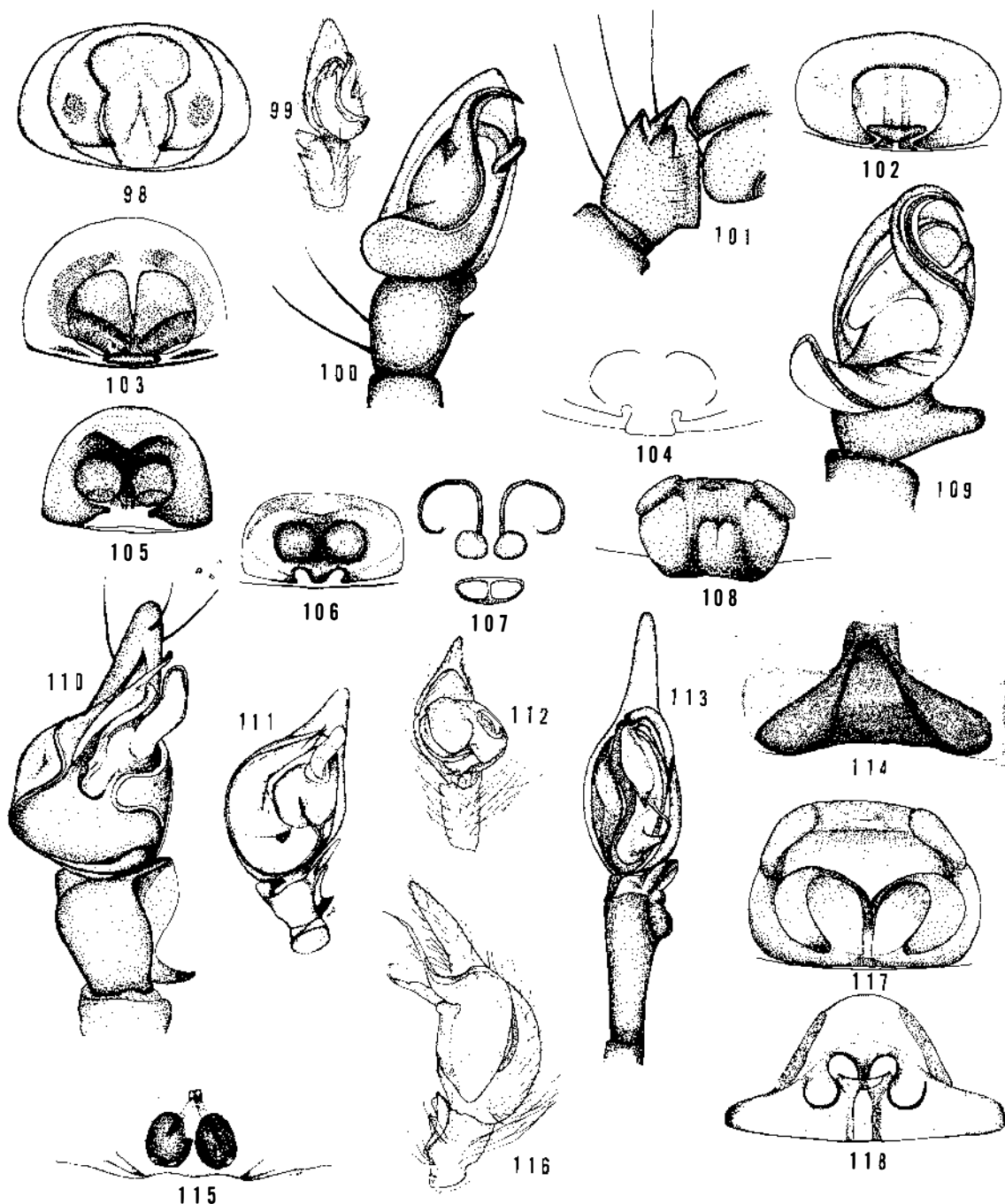
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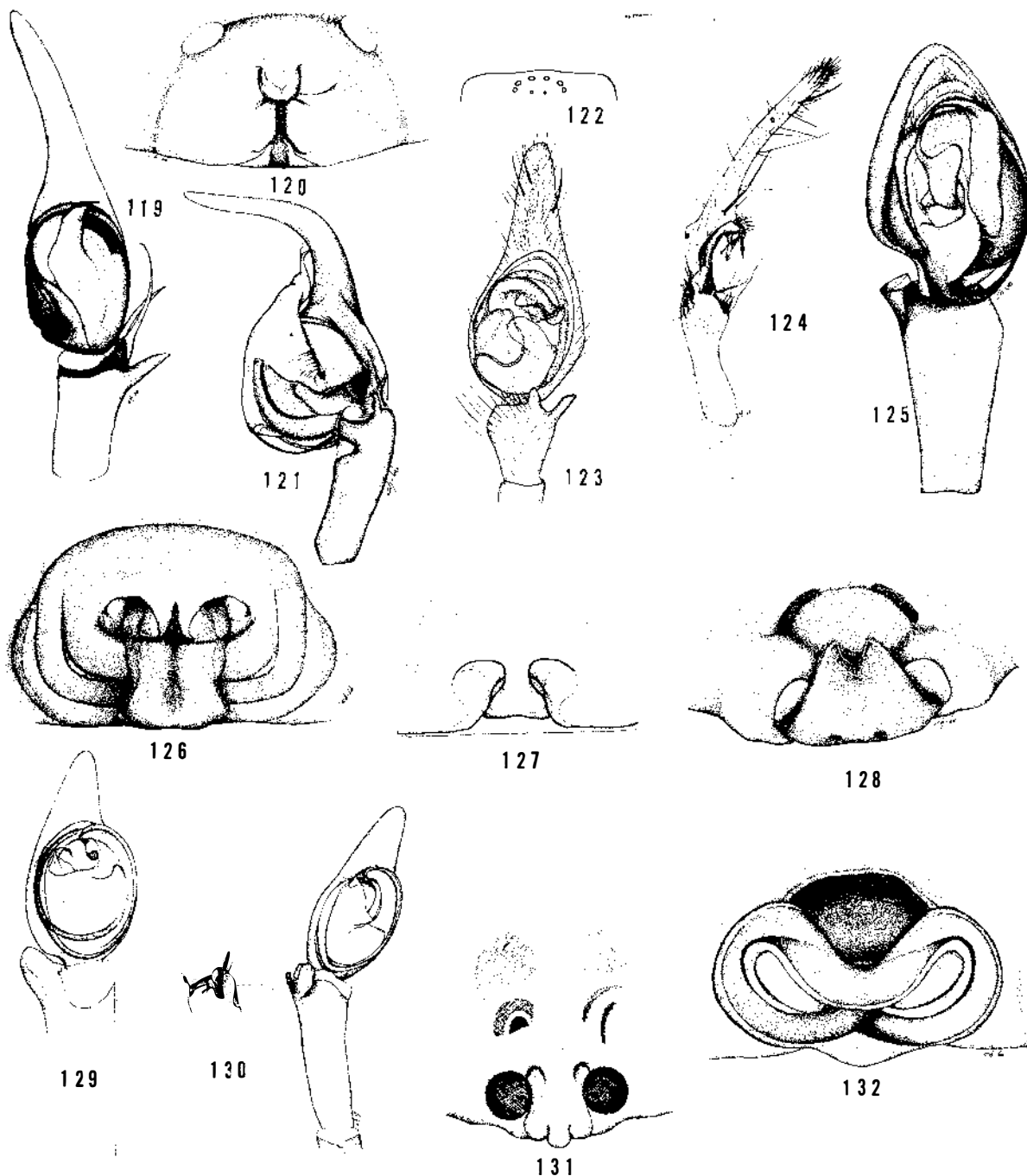
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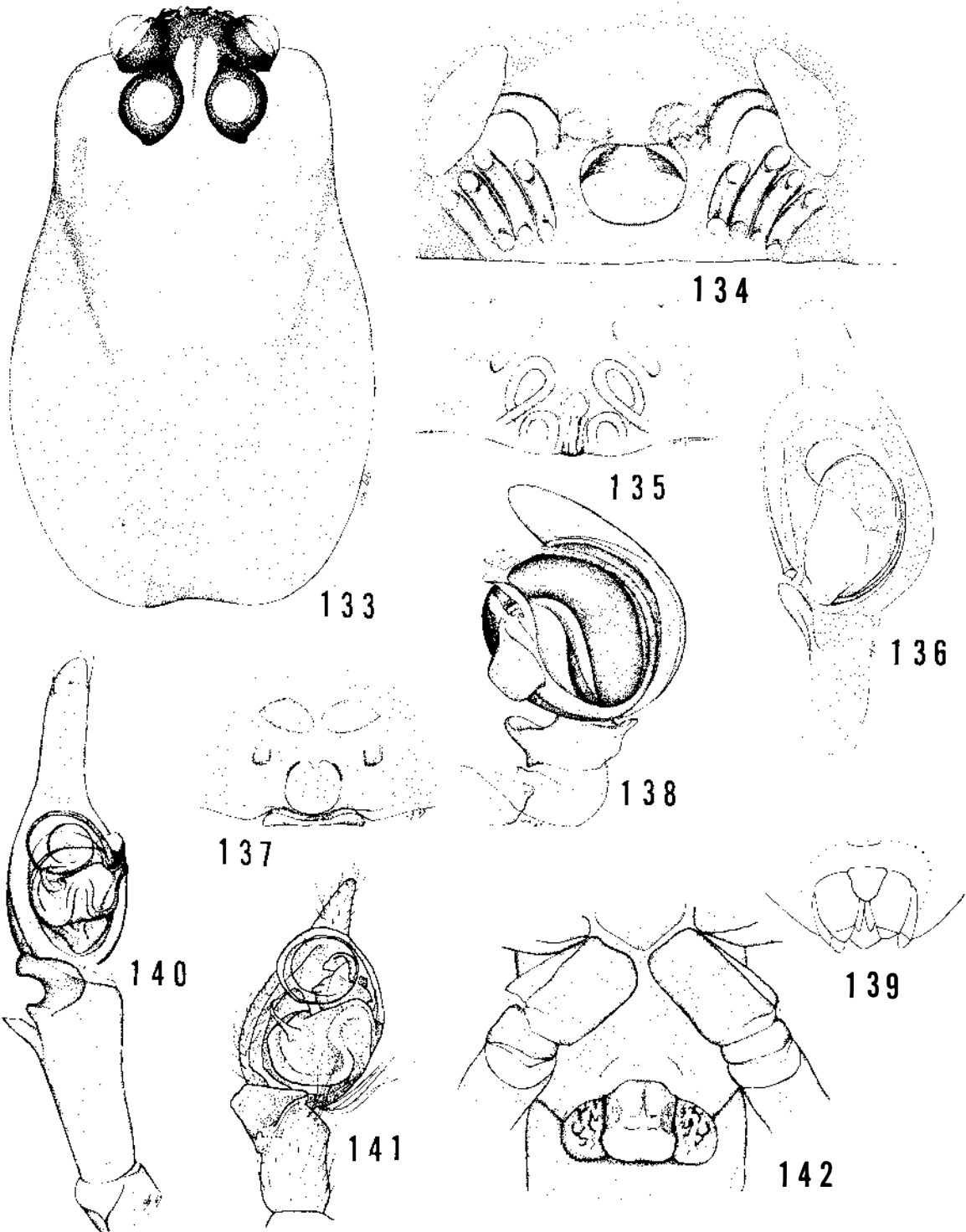
Figs. 86 - 97. - 86: *Phanotea natalensis* ♂-p, 87: *Phanotea peringueyi* ♂-p, 88: *Devendra seriata* ♂-p, 89: *Machadonia urbense* ♂-p, 90: *Phanotea peringueyi* ♀-e, 91: *Devendra pardale* ♀-e, 92: *Machadonia punctata* ♀-e, 93: *Symposia silvicola* ♀-e, 94: *Symposia umbrosa* ♀-e, 95: *Symposia silvicola* ♂-p, 96: *Callevopsis striata* ♀-p, 97: *Symposia umbrosa* ♂-p. - Orig.



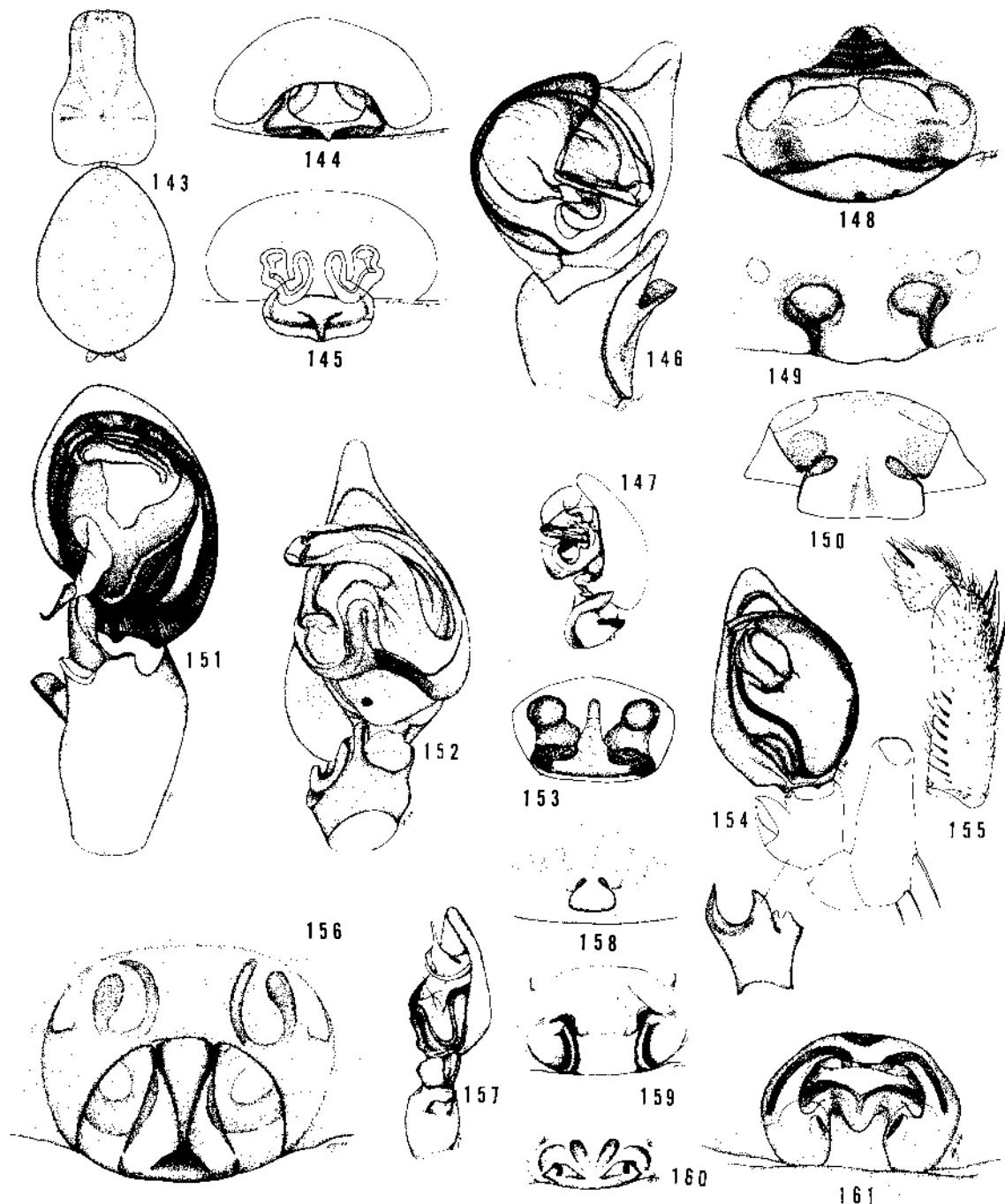
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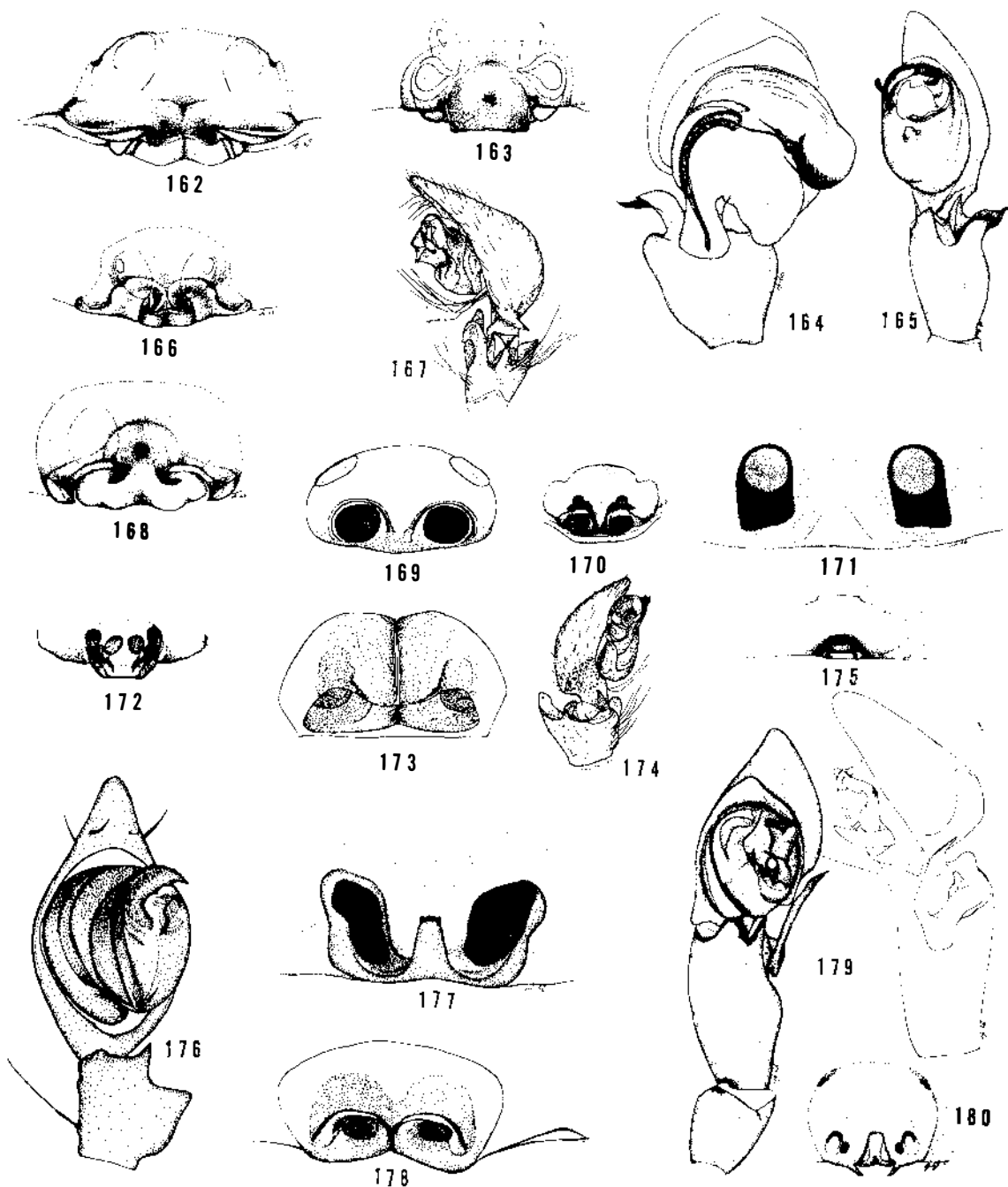
Figs. 119 – 132. – 119: *Porteria albopunctata* ♂-p, 120: *Porteria albopunctata* ♀-e, 121: *Corasoides australis* ♂-p, 122: *Taurongia punctata* ♂, eyes, 123: *Taurongia punctata* ♂-p, 124: *Cambridgea foliata* ♂-p, 125: *Huara antarctica* ♂-p, 126: *Corasoides australis* ♀-e, 127: *Taurongia punctata* ♀-e, 128: *Cambridgea foliata* ♀-e, 129: *Desis marina* ♂-p, 130: *Desis kenyonae* ♂-p, 131: *Desis inermis* ♀-e, 132: *Huara antarctica* ♀-e. – Orig.



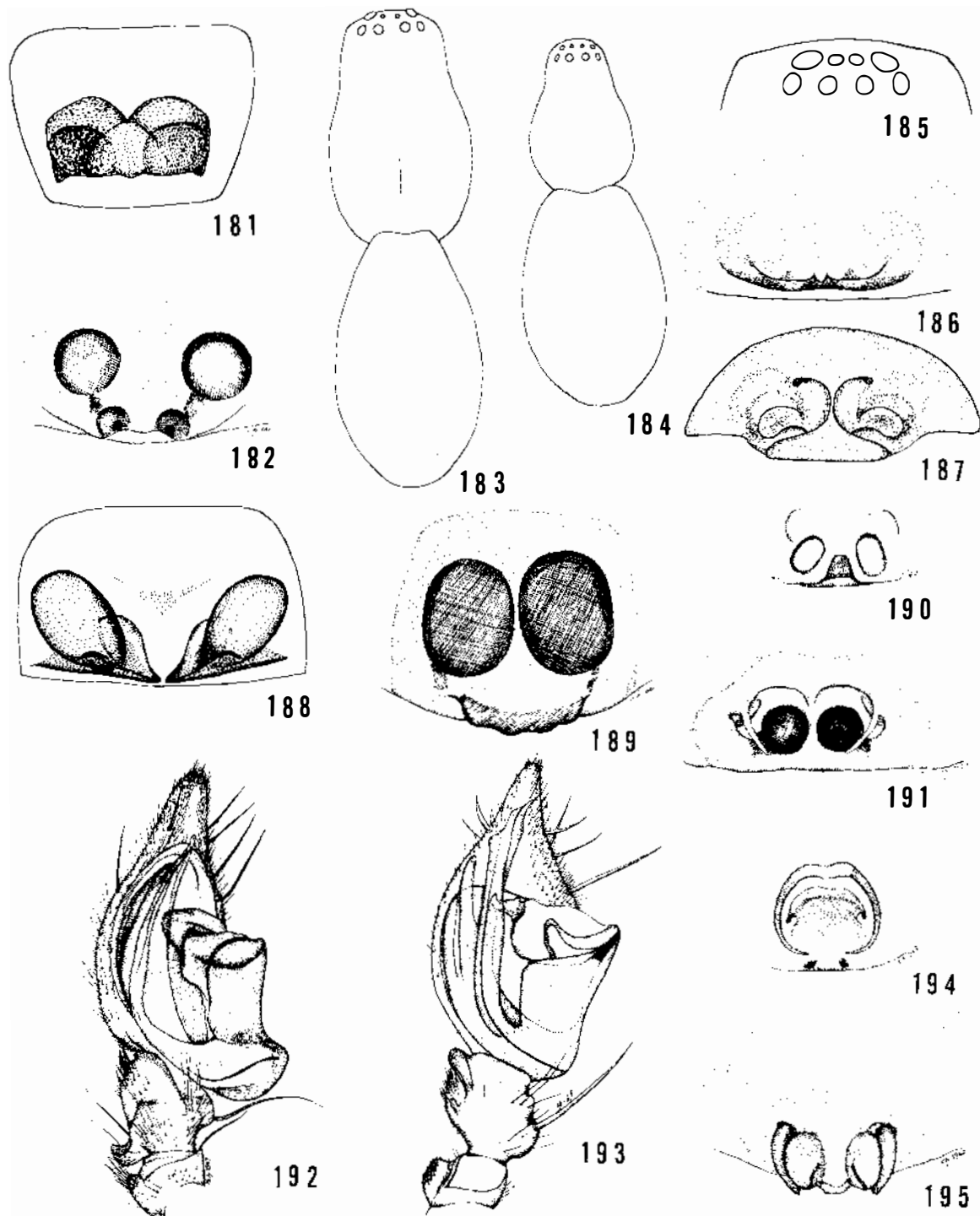
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Figs. 143 – 161. – 143: *Arctobius agelenoides*, dorsal pattern, 144: *Arctobius agelenoides*, ♀-e, 145: *Arctobius agelenoides*, vulva, 146: *Arctobius agelenoides*, ♂-p, ventral view, 147: *Arctobius agelenoides*, ♂-p, lateral view, 148: *Yupanquia schiapellii*, ♀-e, 149: *Anisacate* sp., ♀-e, 150: *Anisacate fuegiana* ♀-e, 151: *Rubrius castaneifrons* ♂-p, 152: *Rubrius major* ♂-p, 153: *Zanomys kaiba* ♀-e, 154: *Pinus pitus* ♂-p, 155: *Pinus pitus*, stridulatory organ of male palpal femur, 156: *Rubrius major*, ♀-e, 157: *Rubrius antarcticus* ♂-p, 158: *Zanomys californica* ♀-e, 159: *Rubrius annulatus* ♀-e, 160: *Rubrius antarcticus* ♀-e, 161: *Pinus pitus* ♀-e. – Orig.

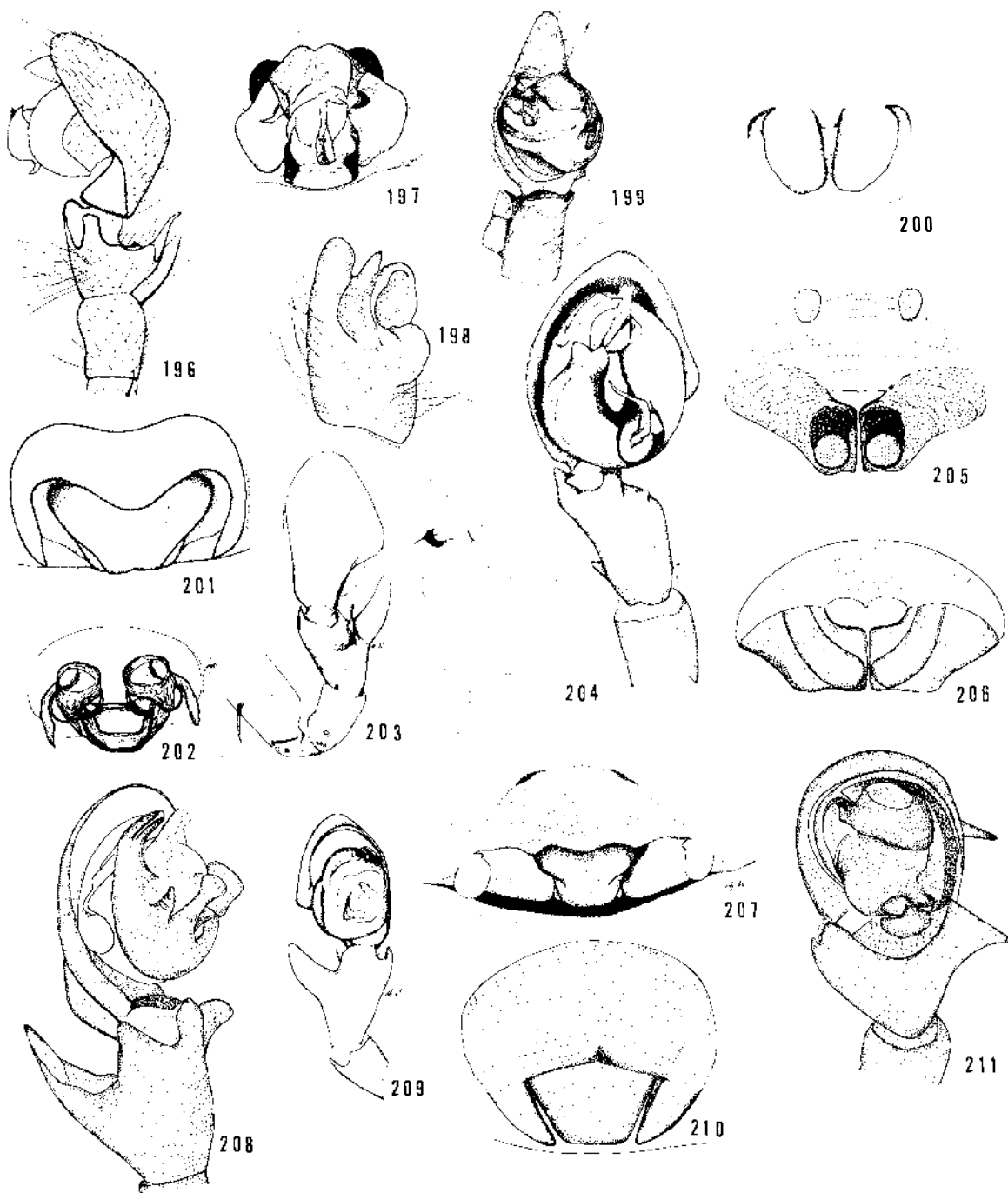


Figs. 162 – 180. – 162: *Retiro procerulus* ♀-e, 163: *Retiro quitensis* ♀-e, 164: *Pseudauximus pallidus* ♂-p, 165: *Pseudauximus reticulatus* ♂-p, 166: *Retiro crinitus* ♀-e, 167: *Retiro procerulus* ♂-p, 168: *Retiro rhombifer* ♀-e, 169: *Auximella harpagula* ♀-e, 170: *Macrobunus caffer* ♀-e, 171: *Pseudauximus pallidus* ♀-e, 172: *Chresiona albosignata* ♀-e, 173: *Auximella typica* ♀-e, 174: *Macrobunus chilensis* ♂-p, 175: *Obatala armata* ♀-e, 176: *Auximella harpagula* ♂-p, 177: *Chresiona invalida* ♀-e, 178: *Macrobunus backhauseni* ♀-e, 179: *Emmenomma oculatum* ♂-p, 180: *Emmenomma oculatum* ♀-e. – Orig.

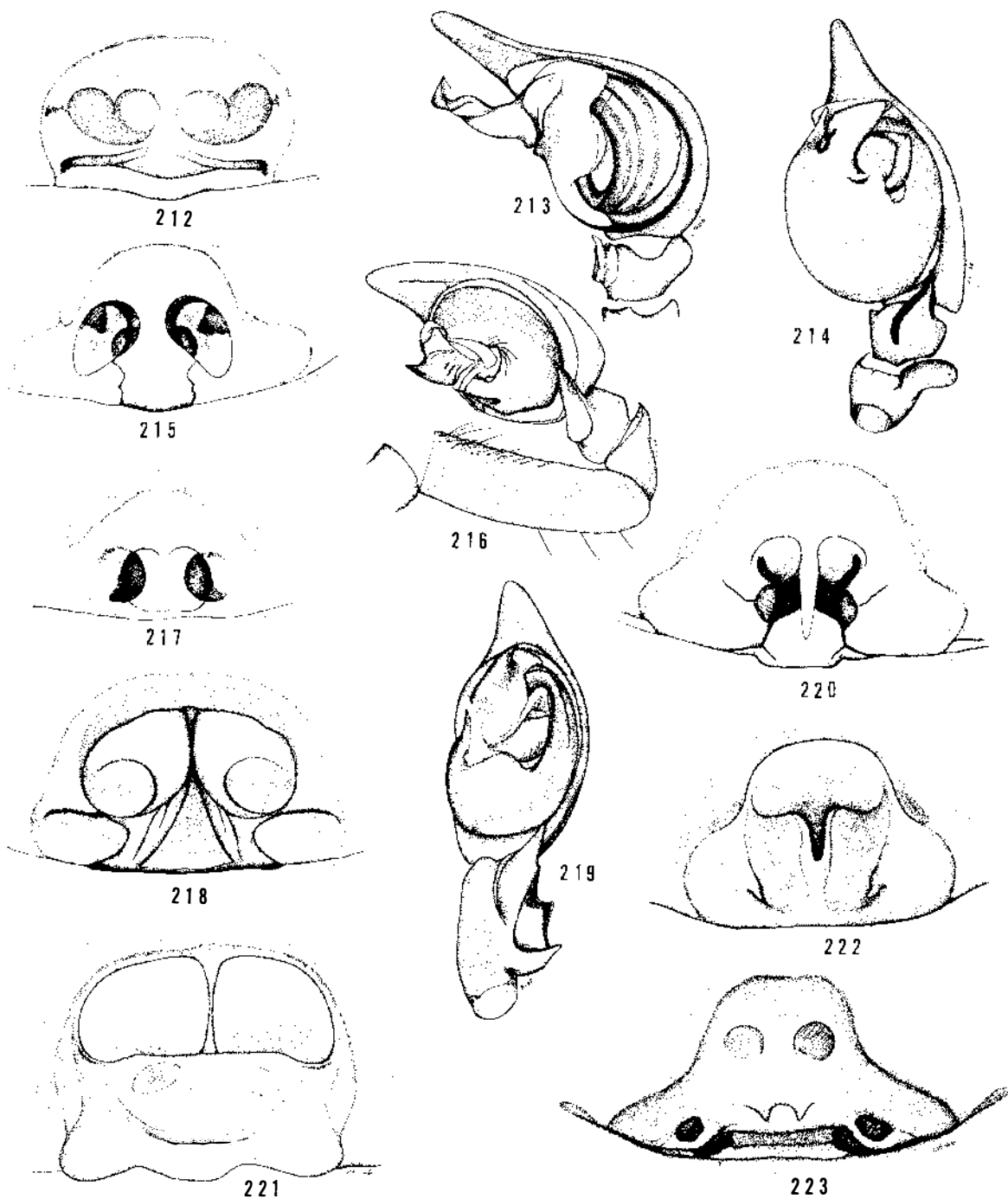


Figs. 181 - 195. - 181: *Attelopsis helvola* ♀-e, 182: *Rhoicinaria maculata* ♀-e, 183: *Yacolla pikelini*, dorsal view, 184: *Attelopsis helvola*, dorsal view, 185: *Neuquenina paupercula*, ocular area, 186: *Neuquenina paupercula* ♀-e, ventral view, 187: *Neuquenina paupercula* ♀-e, caudal view, 188: *Tugana cavatica* ♀-e, 189: *Rhoicinaria rorerae* ♀-e, 190: *Yacolla pikelini* ♀-e, 191: *Metaltella simoni* ♀-e, 192: *Exlinea rorlenta* ♂-p, 193: *Calacadia dentifera* ♂-p, 194: *Exlinea arcoiris* ♀-e, 195: *Rhoicinus gaujoni* ♀-e.

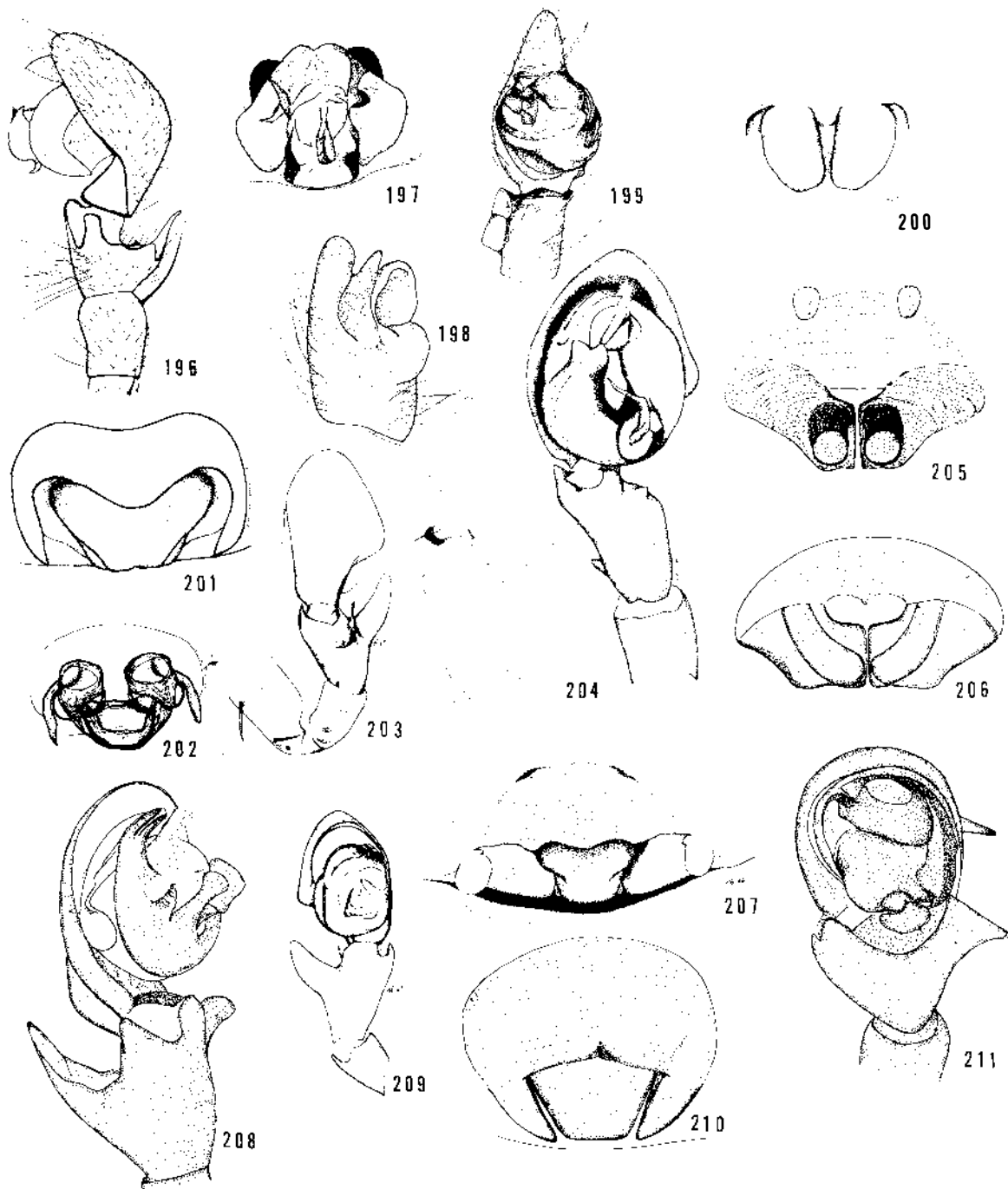
- Orig.



Figs. 196 – 211. – 196: *Amaurobius fenestralis* ♂-p, 197: *Tamgrinia alveolifera* ♀-e (syntype of *Amaurobius potanini*), 198: *Tamgrinia alveolifera* ♂ palpal tibia, 199: *Tamgrinia alveolifera* ♂-p, 200: *Callobius claustrarius* ♀-e, 201: *Amaurobius fenestralis* ♀-e, 202: *Amaurobius fenestralis* ♀ vulva, 203: *Amaurobius barbarus* ♂-p (syntype of *A. annulatus* Simon = n. nud.), dorsal view, 204: *Taira flavidorsalis* ♂-p, 205: *Callioplus crassus* ♀-e, 206: *Callioplus euoplus* ♀-e, 207: *Taira flavidorsalis* ♀-e, 208: *Amaurobius latebrosus* ♂-p, 209: *Amaurobius barbarus* ♂-p, ventral view, 210: *Amaurobius obustus* ♀-e, 211: *Callioplus euoplus* ♂-p. – Orig.



Figs. 212 – 223. – 212: *Tikaderia psechrina* ♀-e, 213: *Benoitia* sp. ♂-p, 214: *Olorunia punctata* ♂-e, 215: *Olorunia ocellata* ♀-e, 216: *Agelena labyrinthica* ♂-p, 217: *Agelenella pusilla* ♀-e, 218: *Kidugua spiralis* ♀-e, 219: *Calilena restricta* ♂-p, 220: *Calilena restricta* ♀-e, 221: *Agelena labyrinthica* ♀-e, 222: *Hololena hola* ♀-e, 223: *Novalena intermedia* ♀-e. – Orig.



Figs. 196 – 211. – 196: *Amaurobius fenestralis* ♂-p, 197: *Tamgrinia alveolifera* ♀-e (syntype of *Amaurobius potanini*), 198: *Tamgrinia alveolifera* ♂ palpal tibia, 199: *Tamgrinia alveolifera* ♂-p, 200: *Callobius claustrarius* ♀-e, 201: *Amaurobius fenestralis* ♀-e, 202: *Amaurobius fenestralis* ♀ vulva, 203: *Amaurobius barbarus* ♂-p (syntype of *A. annulatus* Simon = n. nud.), dorsal view, 204: *Taira flavidorsalis* ♂-p, 205: *Callioplus crassus* ♀-e, 206: *Callioplus euoplus* ♀-e, 207: *Taira flavidorsalis* ♀-e, 208: *Amaurobius latebrosus* ♂-p, 209: *Amaurobius barbarus* ♂-p, ventral view, 210: *Amaurobius obustus* ♀-e, 211: *Callioplus euoplus* ♂-p. – Orig.

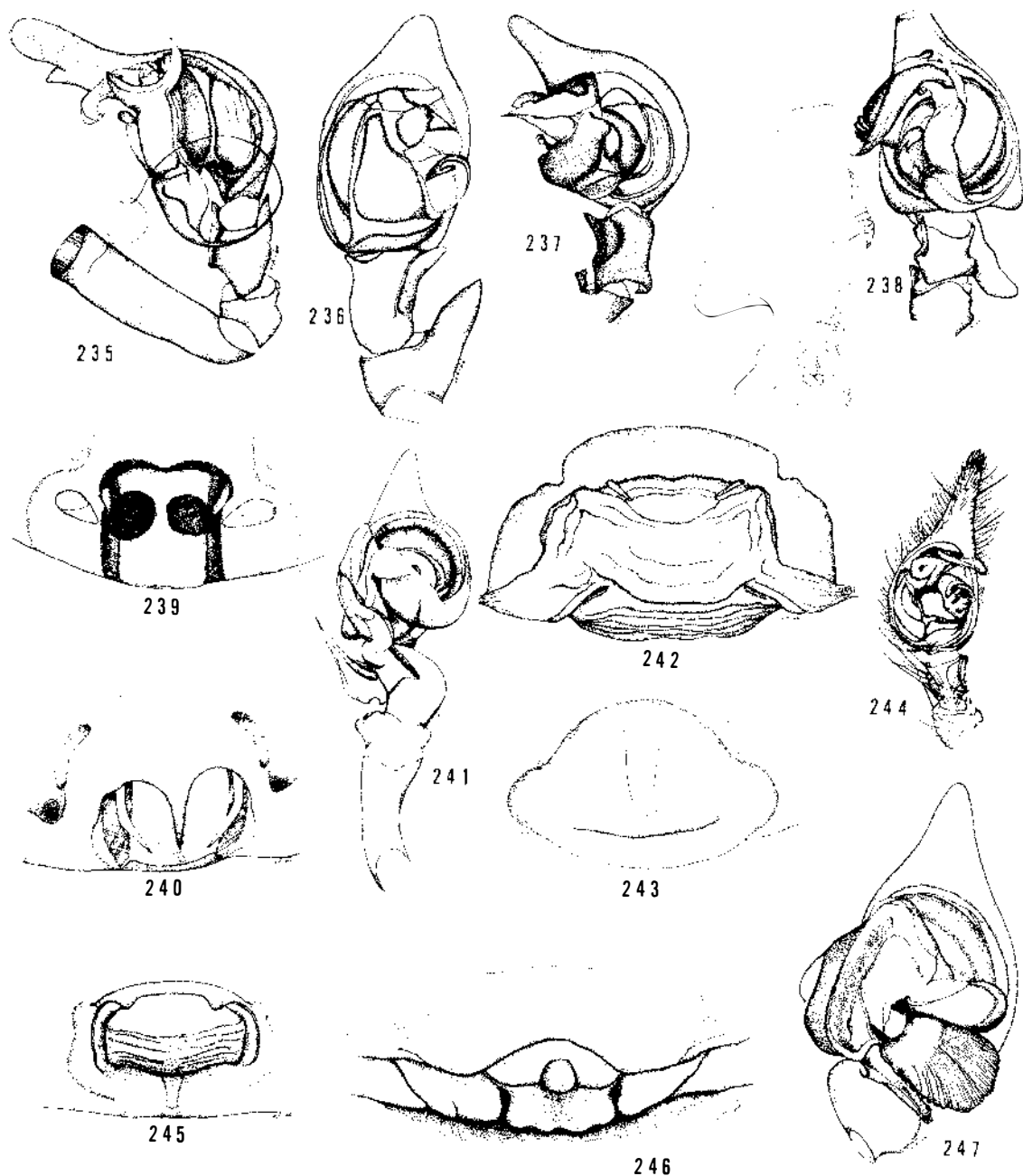
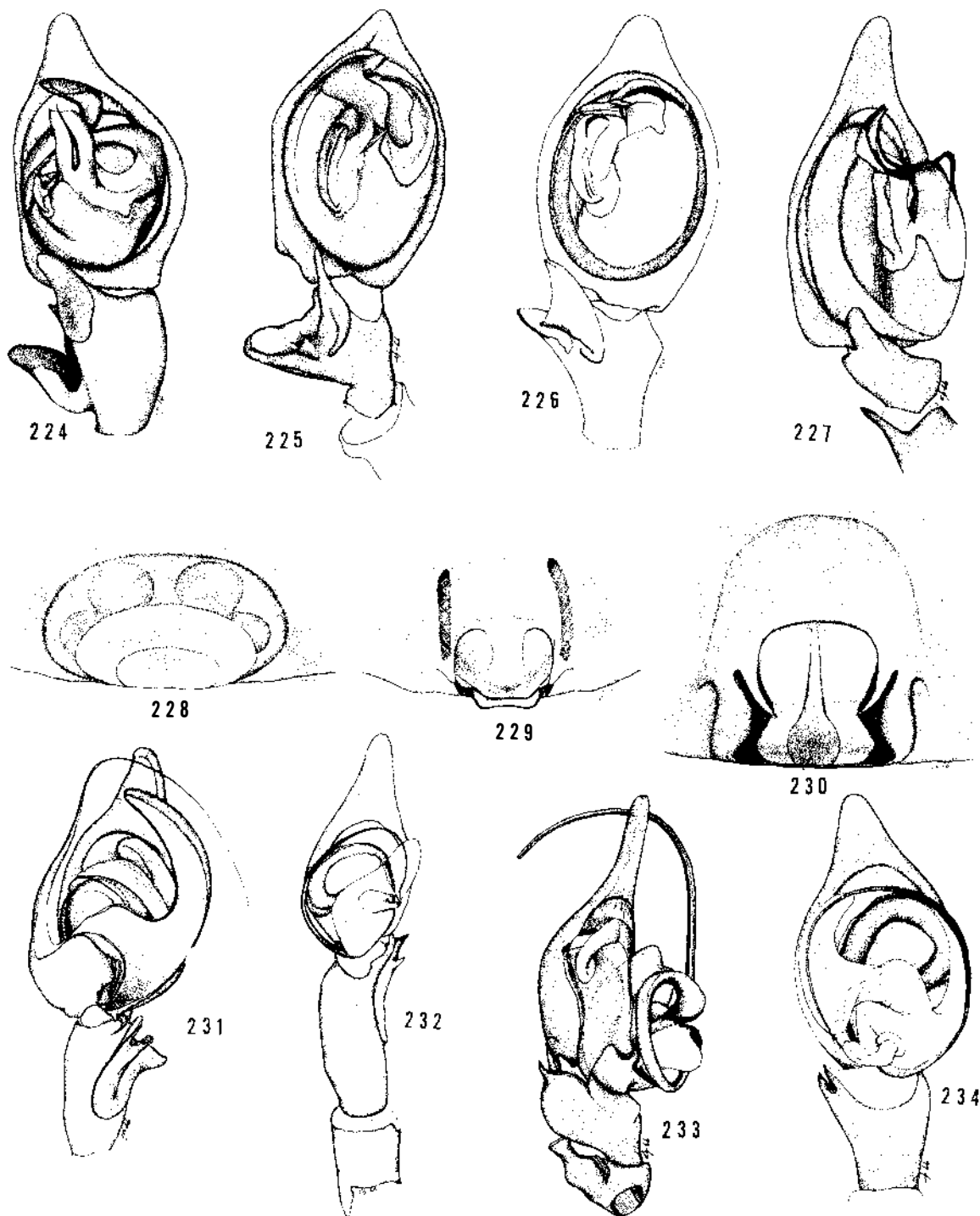
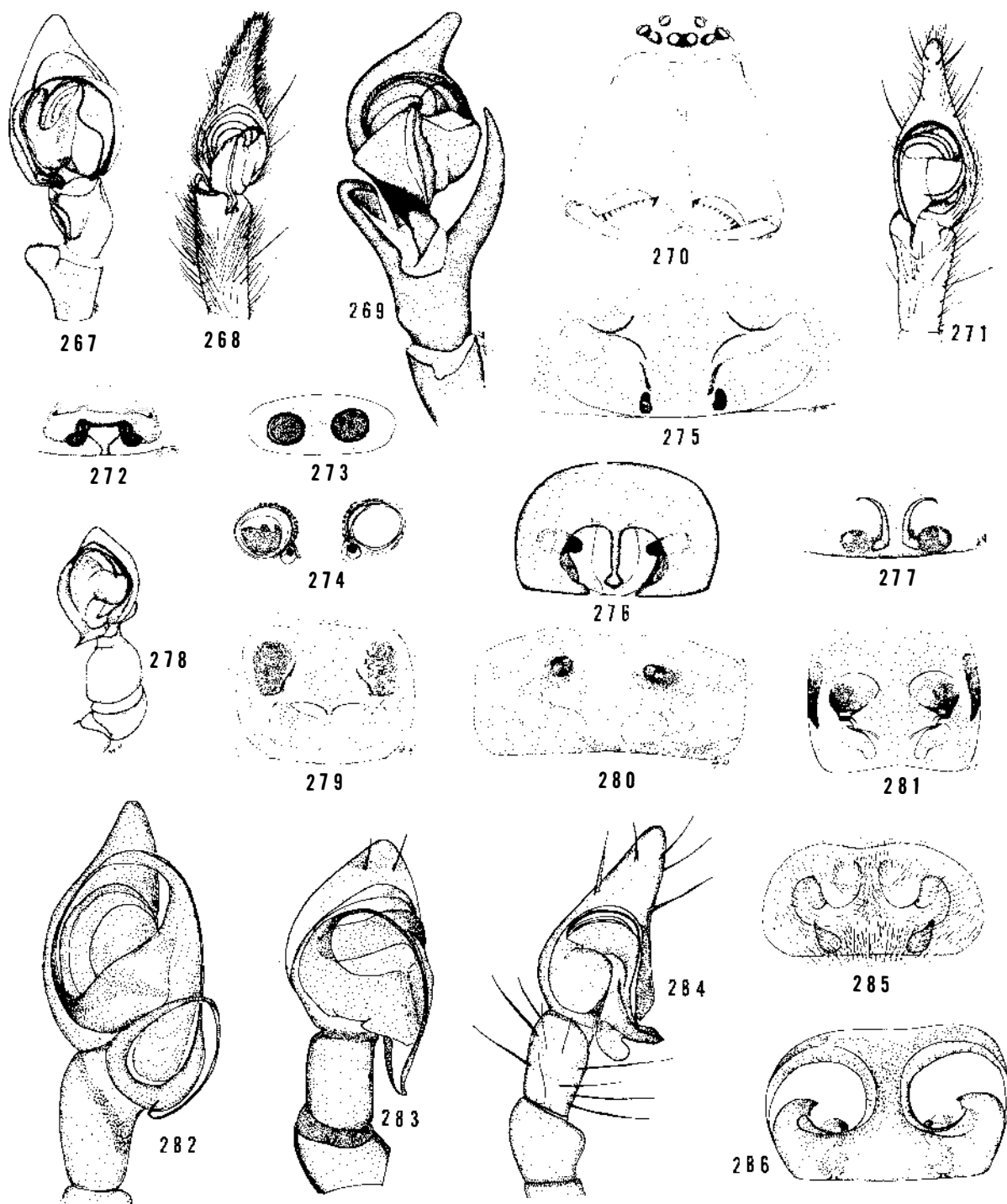


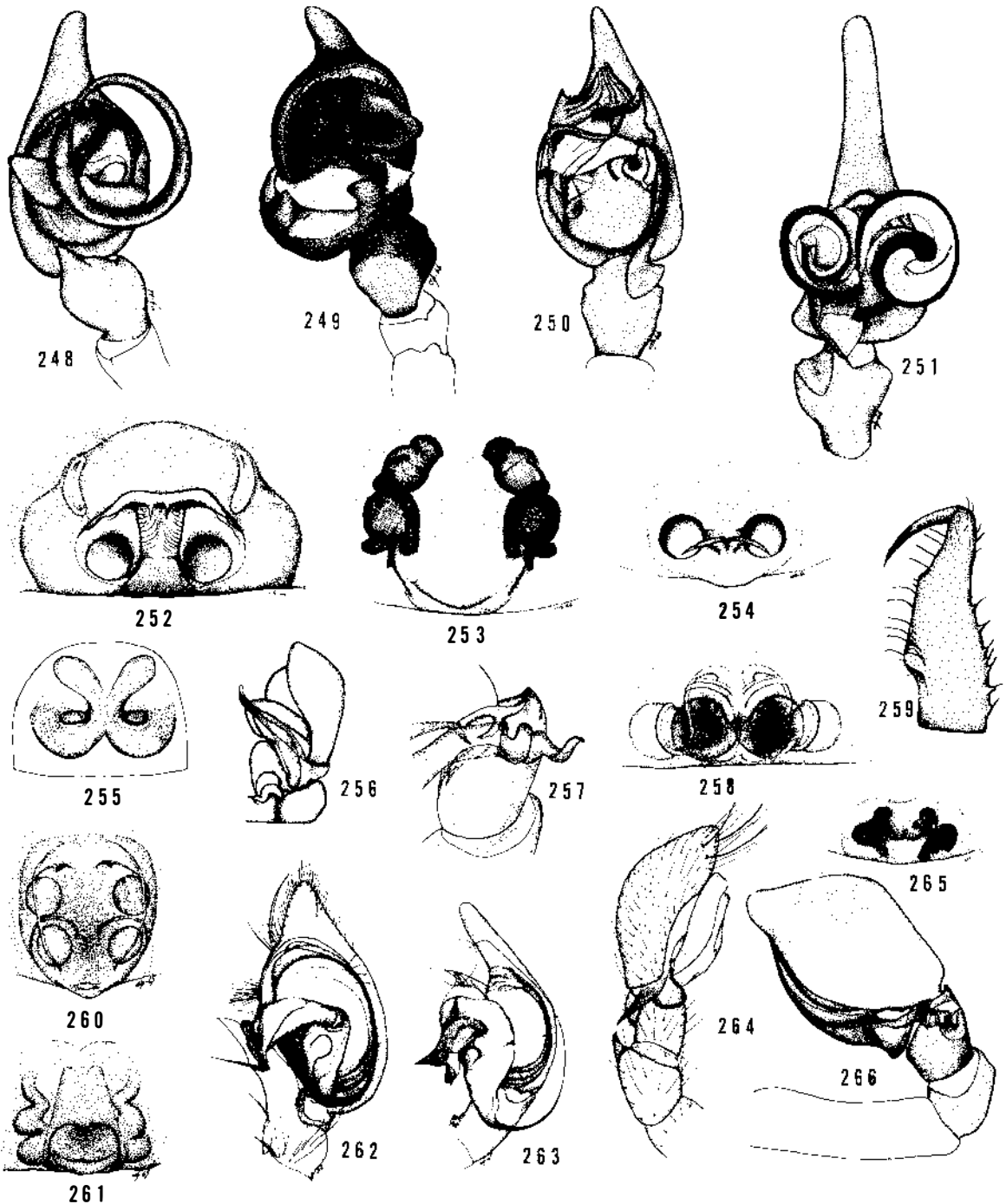
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Figs. 224 – 234. – 224: *Hololena hola* ♂-p, 225: *Novalena intermedia* ♂-p, 226: *Rualena* sp. ♂-p, 227: *Mistaria* sp. ♂-p, 228: *Pseudotegenaria oribata* ♀-e, 229: *Rualena* sp. ♀-e, 230: *Mistaria* sp. ♀-e, 231: *Tegenaria ferruginea* ♂-p, 232: *Pseudotegenaria oribata* ♂-p, 233: *Histopona torpida* ♂-p, 234: *Malthonica lusitanica* ♂-p. – Orig.



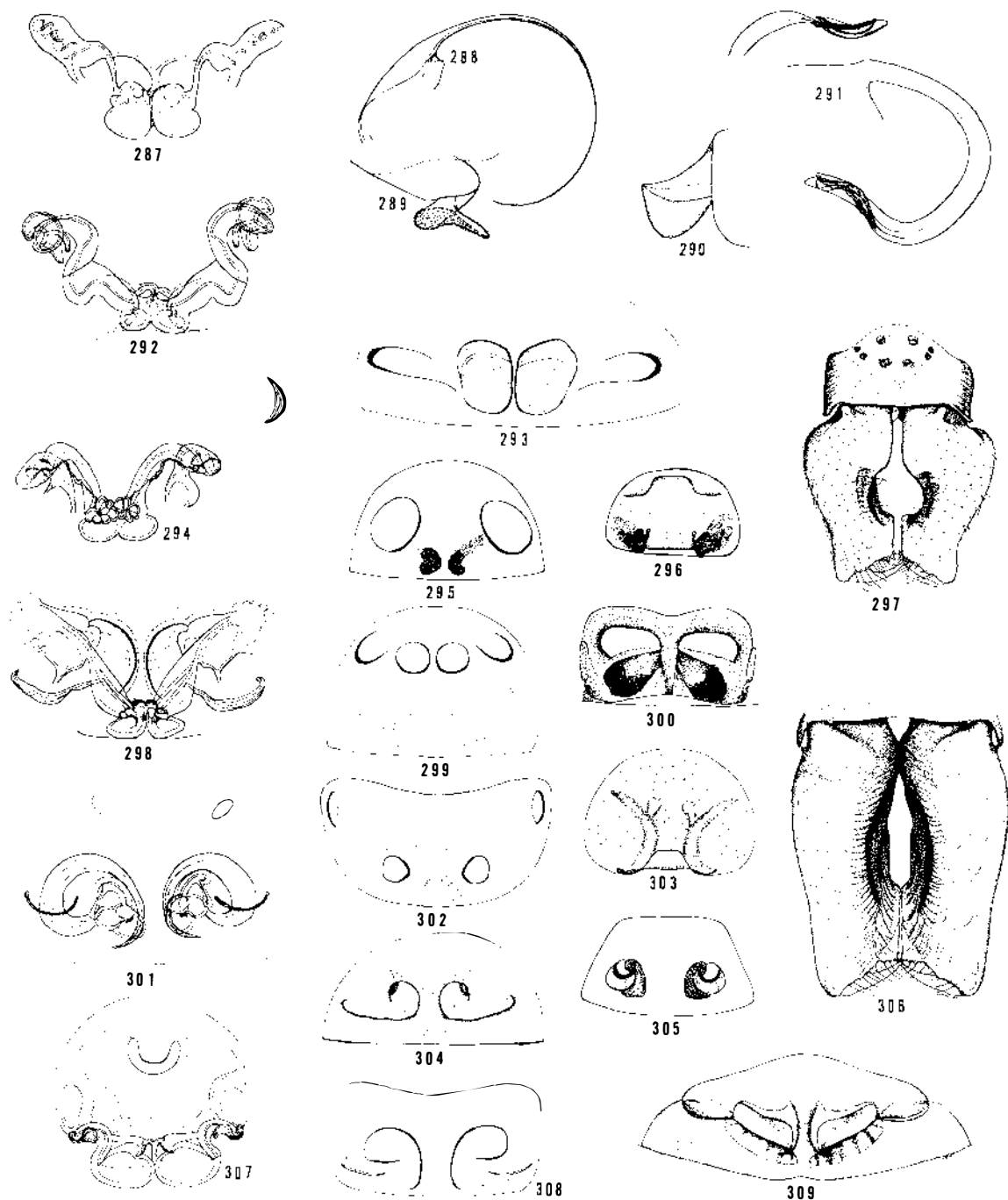
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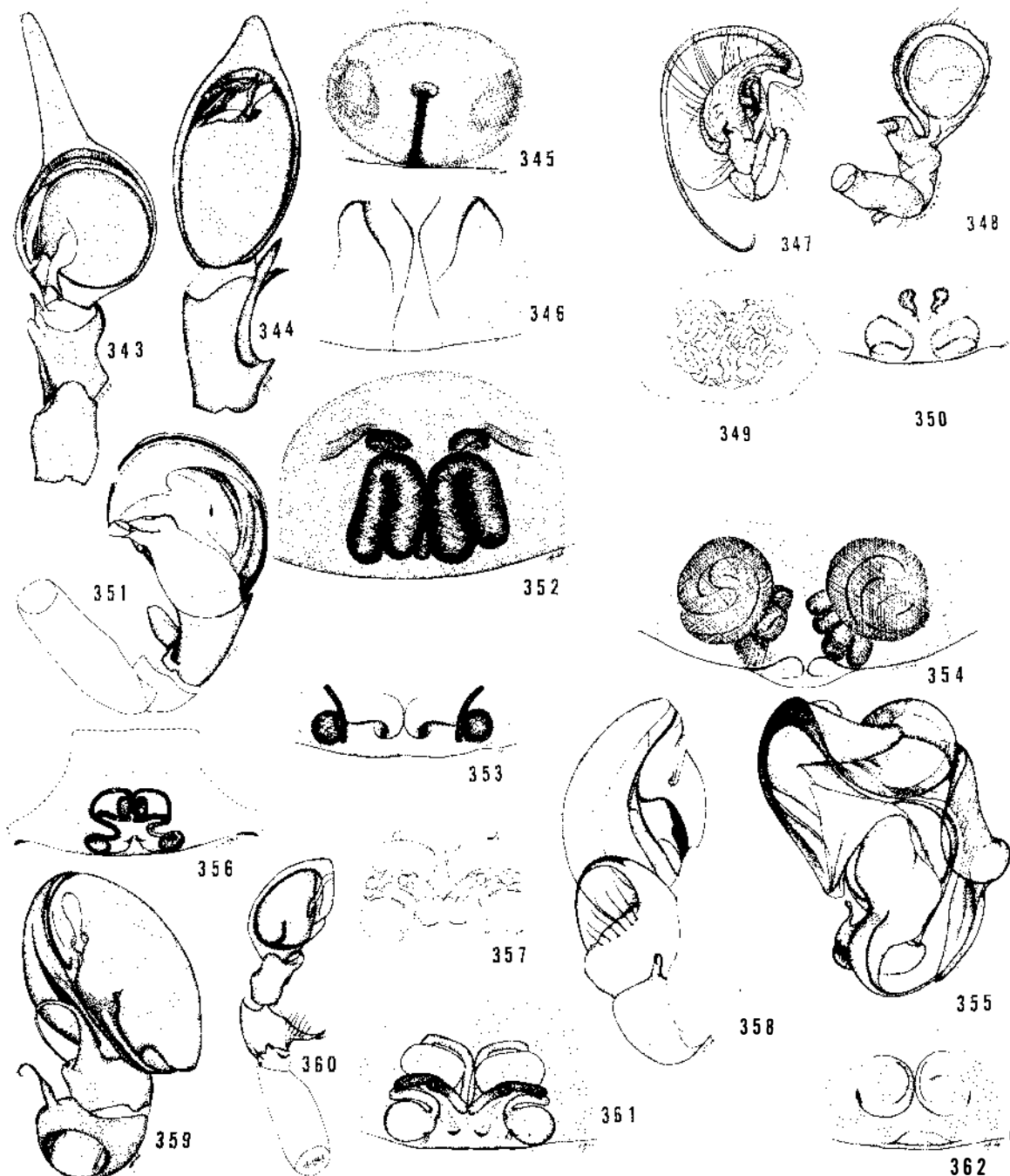
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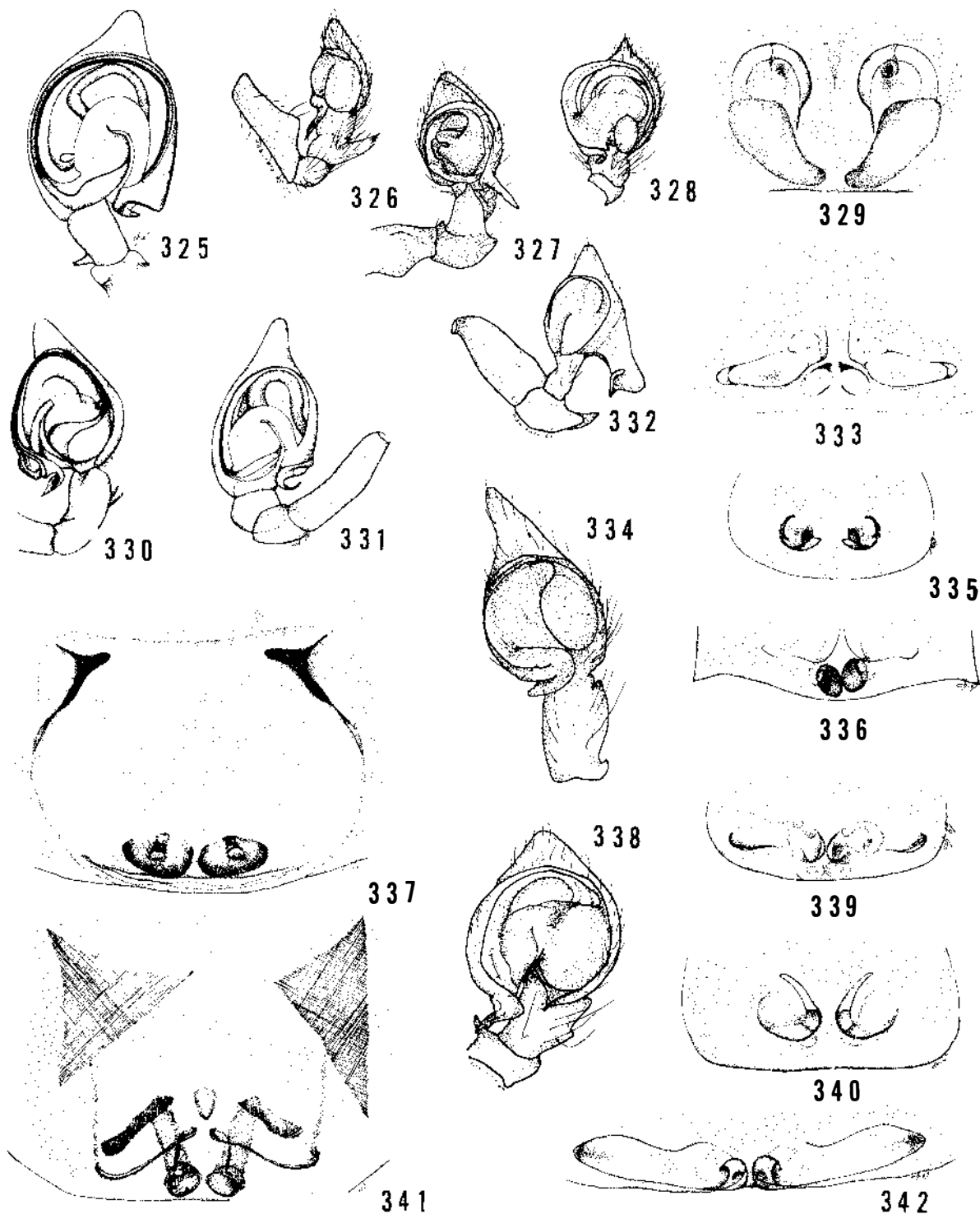
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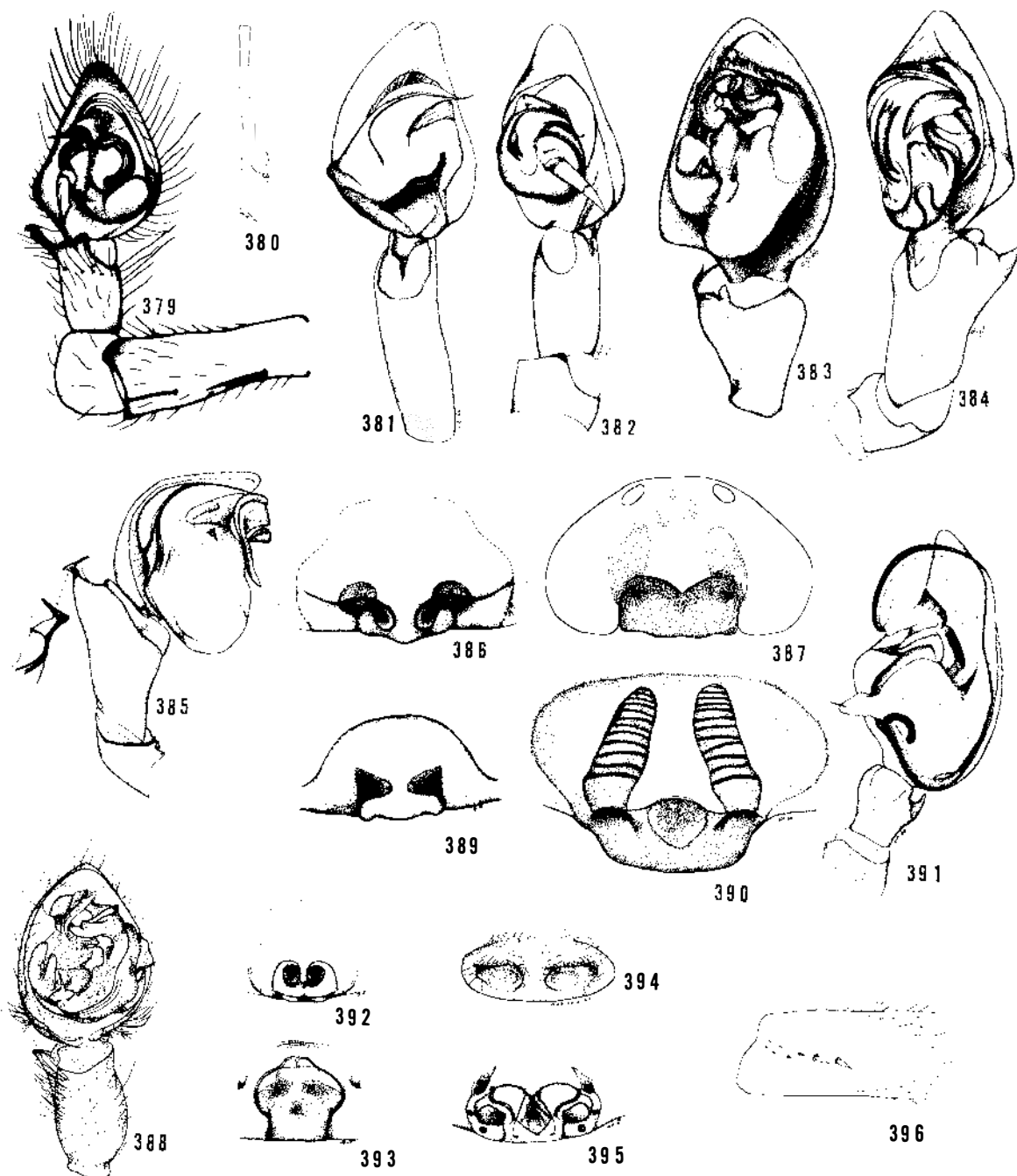
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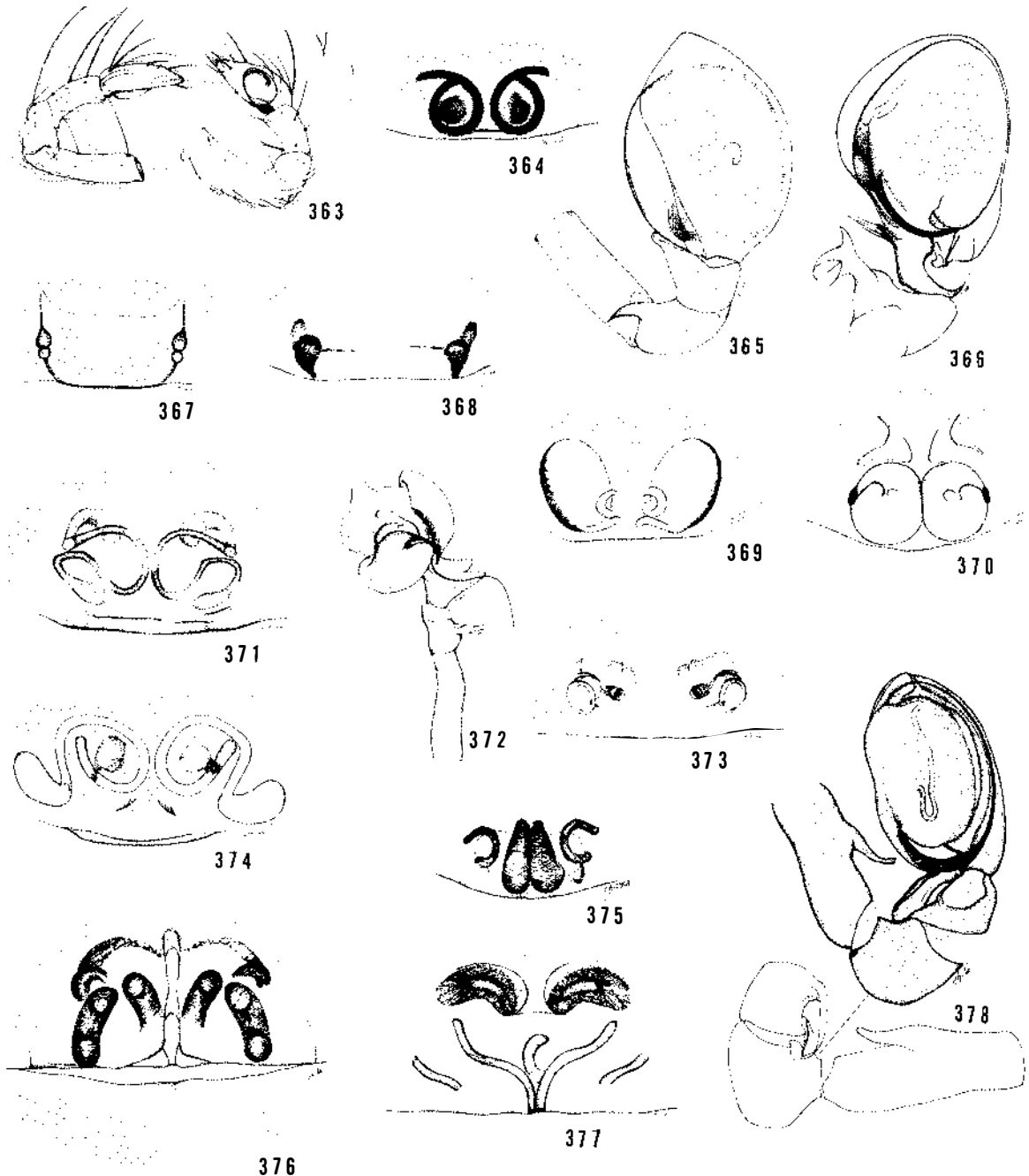
Figs. 343 – 362. – 343: *Calymmaria emertoni* ♂-p, 344: *Dirksia cinctipes* ♂-p, 345: *Calymmaria emertoni* ♀-e, 346: *Dirksia cinctipes* ♀-e, 347: *Tuberta arietina* ♂-p, 348: *Cybaeolus pusillus* ♂-p (syntype material of *Dictyna fuegiana*) 349: *Tuberta arietina*, vulva, 350: *Cybaeolus pusillus* (syntype material of *Dictyna fuegiana*) ♀-e, 351: *Cryphoea silvicola* ♂-p, 352: *Cryphoea silvicola* ♀-e, 353: *Cybaeolus delfini* ♀-e, 354: *Tuberta moerens* ♀-e, 355: *Tuberta moerens* ♂-p, 356: *Muizenbergia abrahami* ♀-e, 357: *Hahnna pusilla*, vulva, 358: *Hahnna corticicola* ♂-p, 359: *Hahnna pusilla* ♂-p, 360: *Muizenbergia schubotzi* ♂-p, 361: *Hahnna pusilla* ♀-p, 362: *Hahnna corticicola* ♀-e. – Orig.



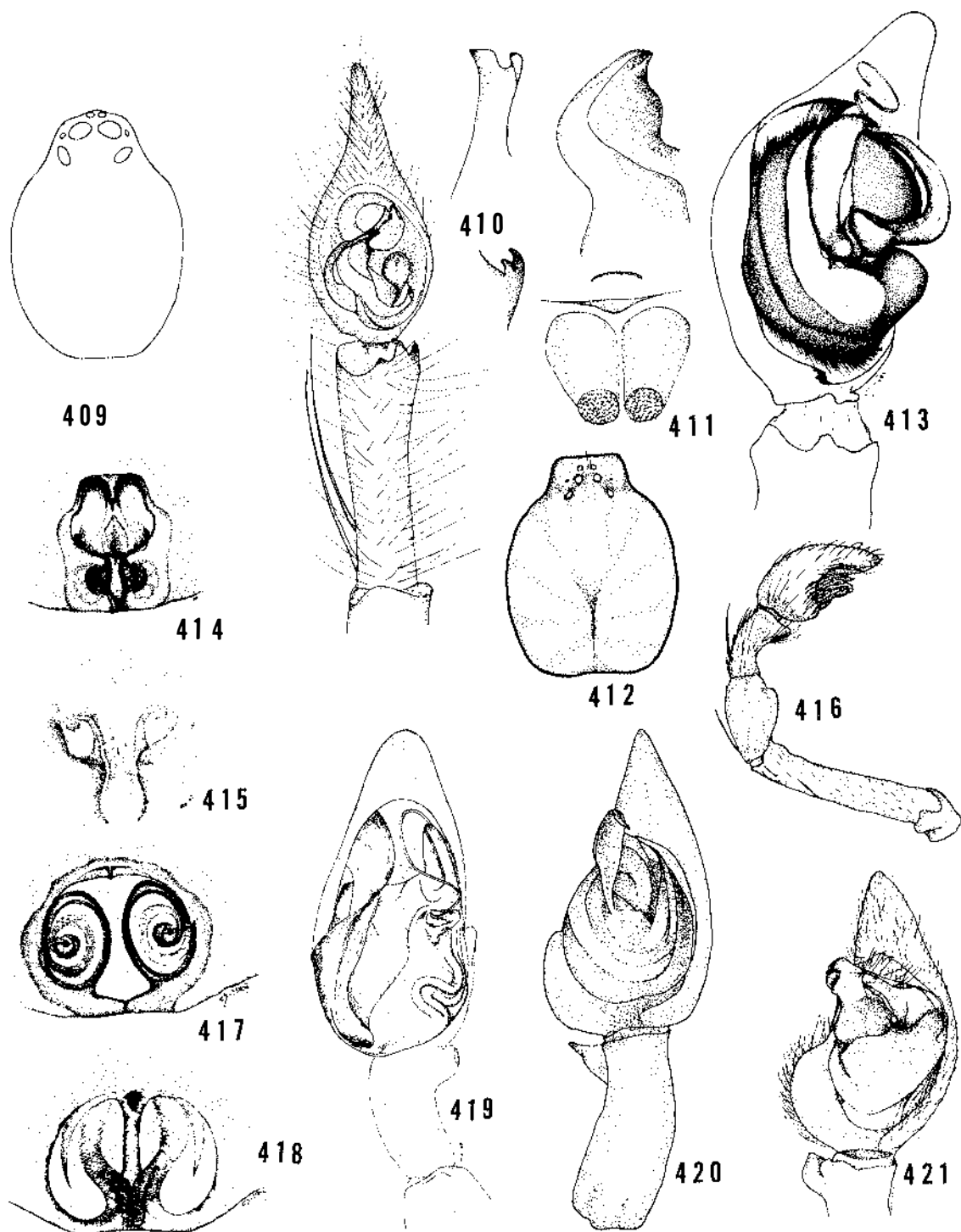
Figs. 325 - 342. - 325: *Archaeodictyna conducta* (holotype) ♂-p, 326: *Tahuantina zapfei* ♂-p, 327: *Anaxibia pictithorax* ♂-p, 328: *Arangina cornigera* ♂-p, 329: *Nigma conducens* ♀-e, 330: «*Archaeodictyna*» *bispinosa* ♂-p, 331: *Nigma conducens* ♂-p, 332: *Ajmonia velifera* ♂-p, 333: *Archaeodictyna conducta* ♀-e (allotype), 334: *Banaidia bifasciata* ♂-p, 335: *Sudesia grammica* ♀-e, 336: «*Embluna*» *togata* ♀-e, 337: *Mashimo leleupi* ♀-e, 338: *Phantyna estebanensis* ♂-p, 339: «*Brigittea*» *colona* ♀-e, 340: *Bri-*
gitta donioi ♀-e, 341: *Panacidia bifasciata* ♀-e, 342: «*Embluna*» *crucifera* - Orig.



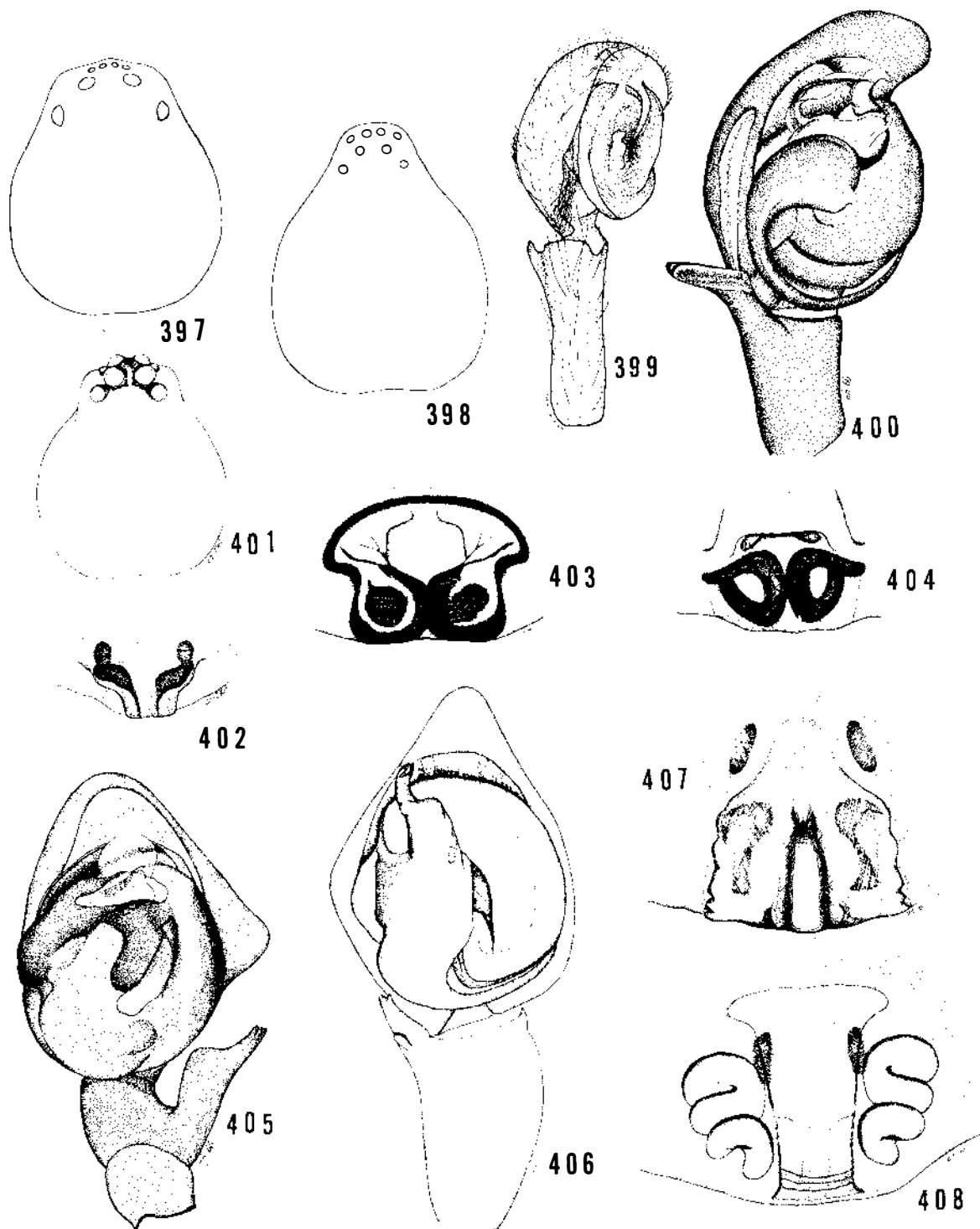
Figs. 379 – 396. – 379: *Phyzelida makapanensis* ♂-p, 380: *Phyzelida mirabilis*, I metatarsus of male, 381: *Phyzeliga mirabilis* ♂-p, 382: *Phyzeliga nebulosa* (holotype of *Haemilla tanganensis*) ♂-p, 383: *Xevioso tuberculata* ♂-p, 384: *Themacrys irrorata* ♂-p (holotype of *Haemilla australis*), 385: *Matundua silvatica* ♂-p (*Auximus hottentottus*: Purcell, type a), 386: *Phyzelida nebulosa* ♀-e (allotype of *Haemilla tanganensis*), 387: *Themacrys irrorata* ♀-e, 388: *Vidole capensis* ♂-p, 389: *Themacrys cavernicola* ♀-e, 390: *Malaika longipes* ♀-e, 391: *Malaika longipes* ♂-p, 392: *Themacrys* sp. ♀-e, 393: *Vidole capensis* ♀-e, 394: *Phyzelida bifoveata* ♀-e, 395: *Matundua trifoveata* ♀-e, 396: *Matundua silvatica*, stridulatory organ at the base of palpal femur. – Orig.



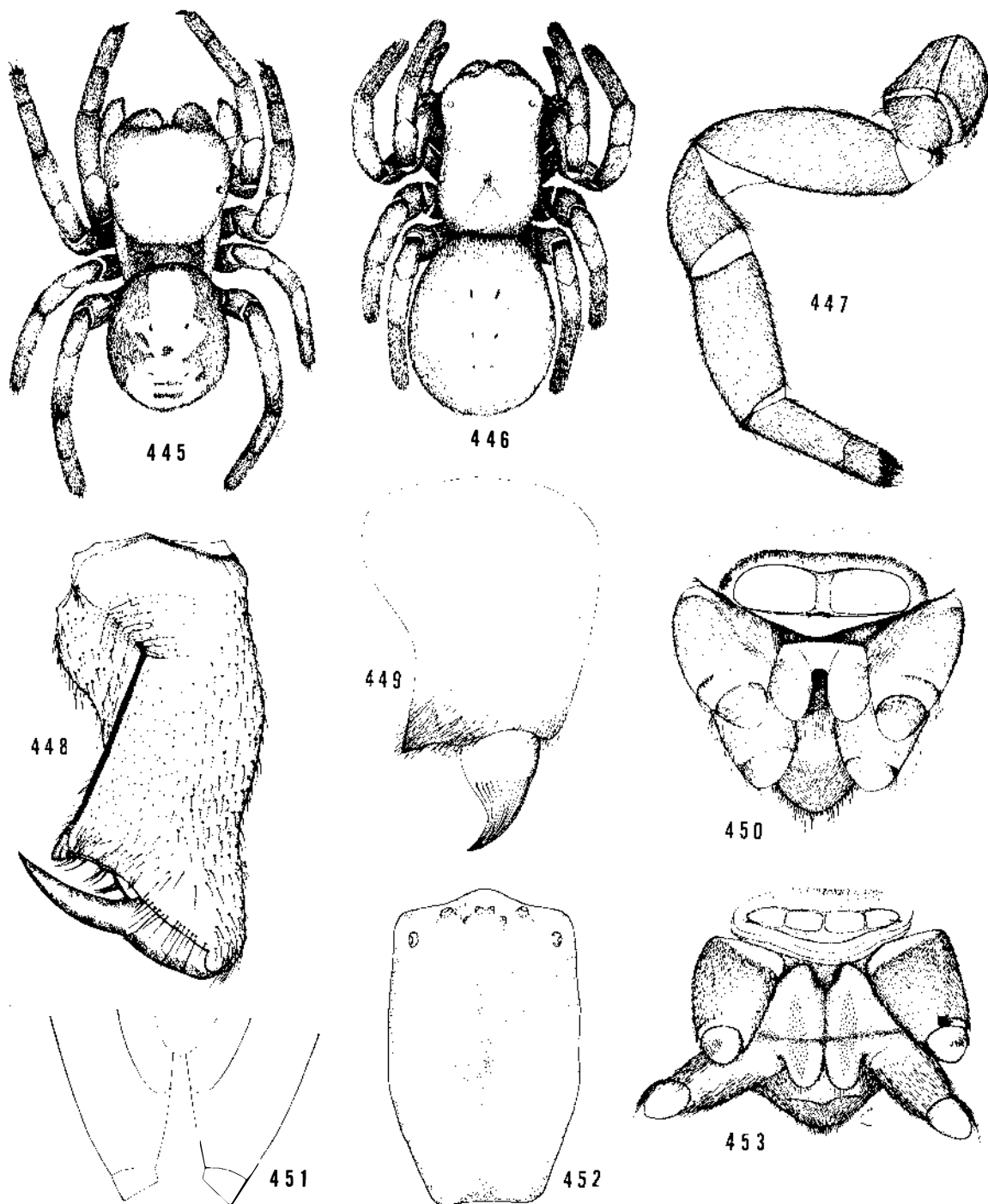
Figs. 363 – 378. – 363: *Alistra stenura* ♂-p, 364: *Neoviola insolens* ♀-e, 365: *Iberina muscicola* ♂-p, 366: *Neohahnia ernesti* ♂-p, 367: *Alistra stenura* ♀-e, 368: *Alistra myops* ♀-e, 369: *Iberina muscicola* ♀-e, 370: *Neohahnia ernesti* ♀-e, 371: *Scotospilus bicolor* ♀-e, 372: *Intihuatana antarctica* ♂-p, 373: *Intihuatana antarctica* ♀-e, 374: *Scotospilus maindroni* ♀-e, 375: *Neoantistea glacialis* ♀-e, 376: *Hahnia* *microchaetensis* ♀-e, 377: *Antistea elegans* ♀-e, 378: *Antistea elegans* ♂-e. – Orig.



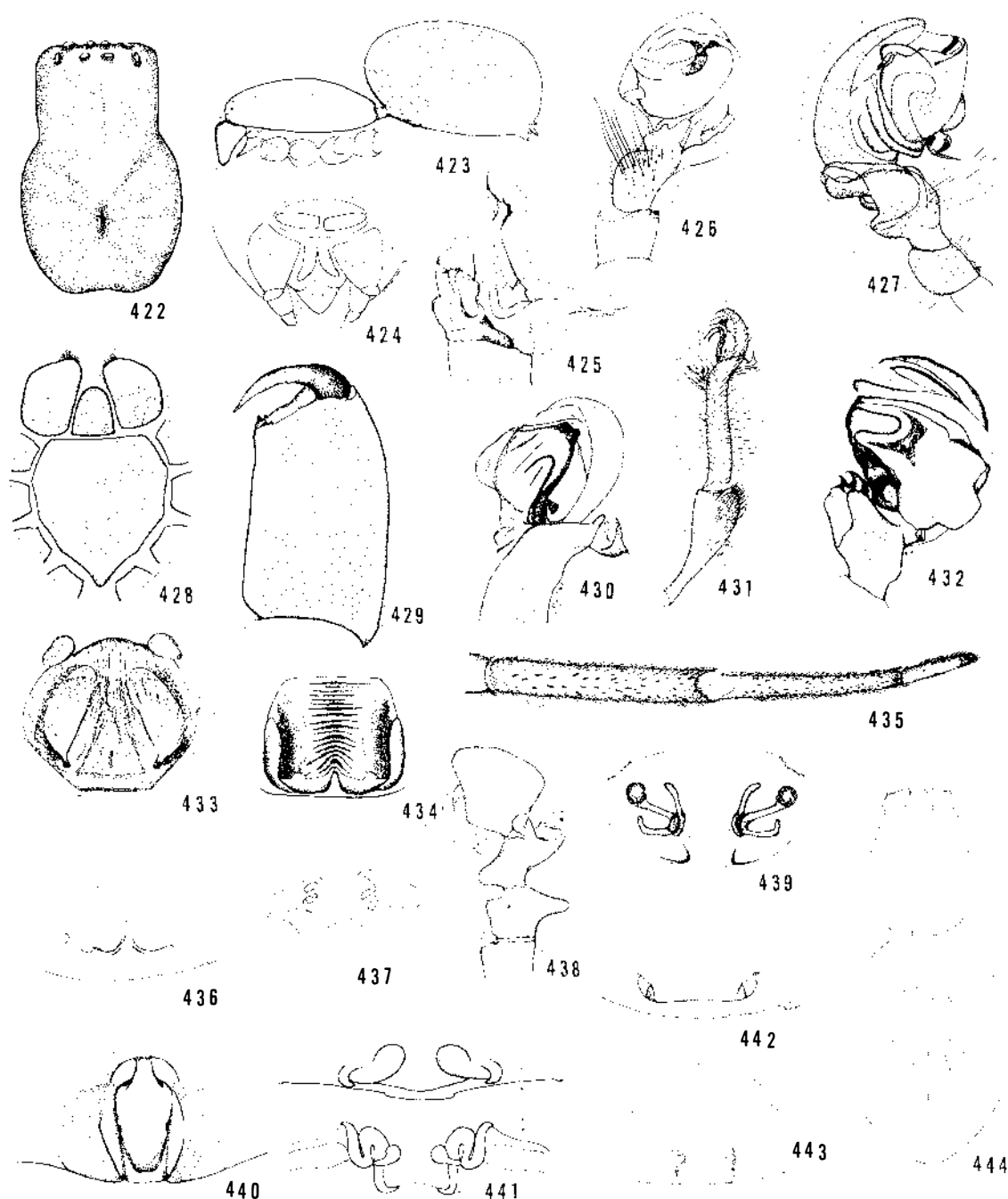
Figs. 409–421. – 409: *Celaetychaeus paradoxus*, carapace, 410: *Acantheis laetus* ♂-p, 411: *Acantheis laetus*, colulus and spinnerets, 412: *Acantheis laetus*, carapace, 413: *Leptoctenus lycosinus* ♂-p, 414: *Acanthoctenus spiniger* ♀-e, 415: *Viracucha andicola* ♀-e, 416: *Viracucha andicola* ♂-p, lateral view, 417: *Nothroctenus marshii* ♀-e, 418: *Gephyroctenus* sp. ♀-e, 419: *Nothroctenus marshii* ♂-p, 420: *Acanthoctenus spiniger* ♂-p, 421: *Viracucha andicola* ♂-p, ventral view. – Orig.



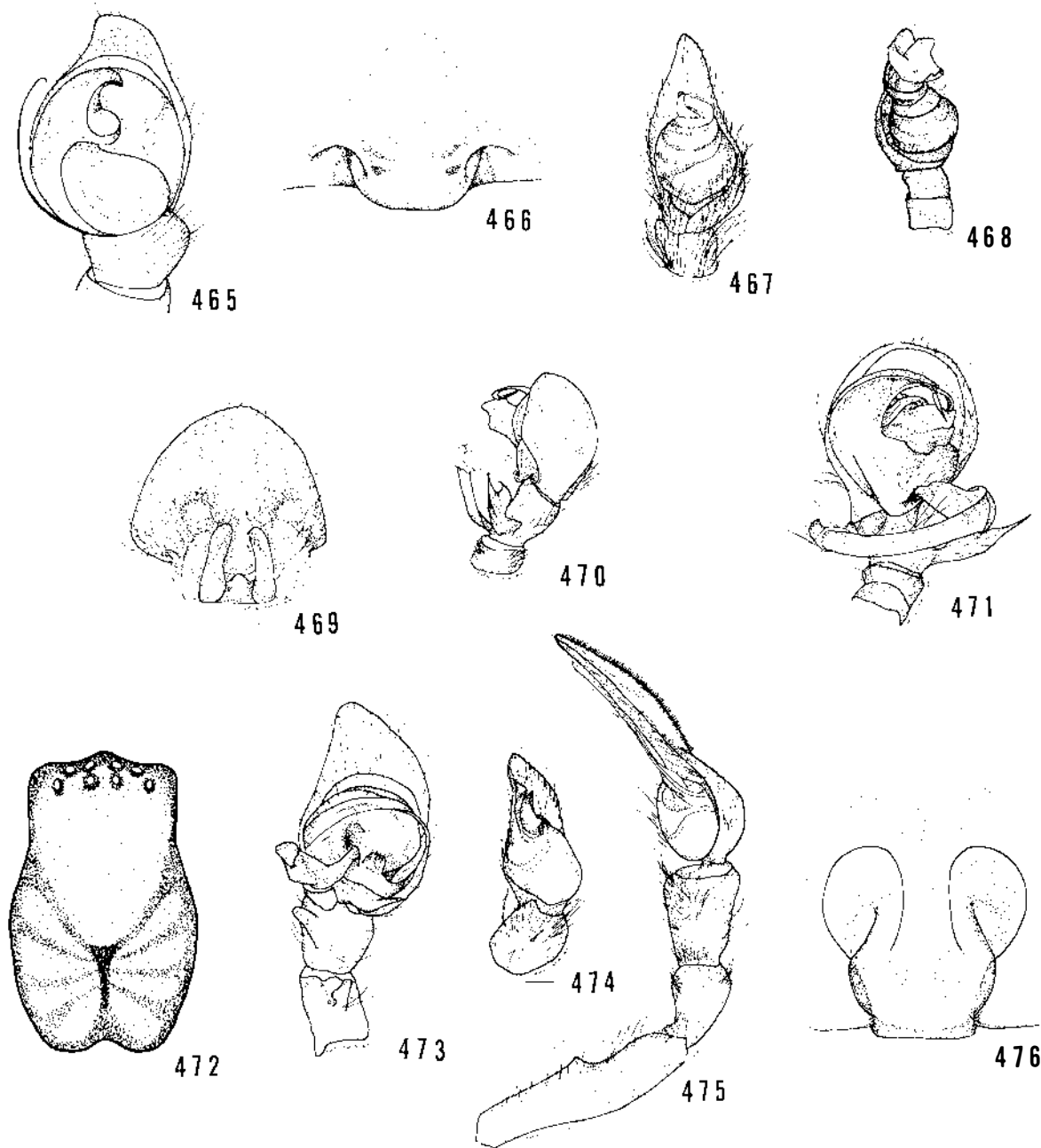
Figs. 397–408. – 397: *Neoctenus finneganiae*, carapace, 398: *Zora spinimana*, carapace, 399: *Zoropsis lutea*, ♂-p, 400: *Hestimodema ambigua* ♂-p, 401: *Zoica parvula*, carapace, 402: *Zoica parvula* ♀-e, 403: *Takeoa nishimurai* ♀-e, 404: *Hestimodema latevittata* ♀-e, 405: *Takeoa nishimurai* ♂-p, 406: *Simonus lineatus* ♂-p, 407: *Xenoctenus marmoratus* ♀-e, 408: *Simonus lineatus* ♀-e. – Orig.



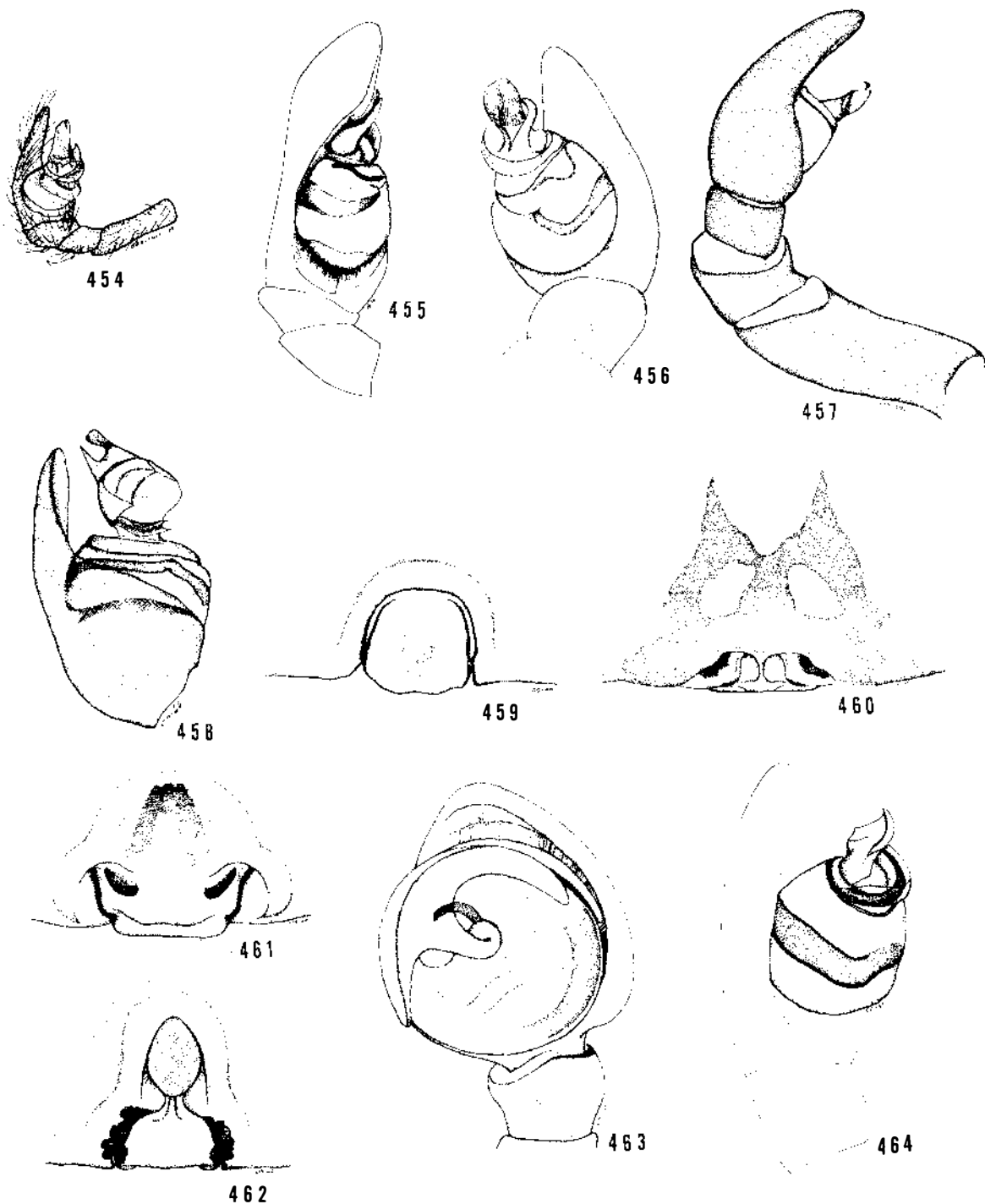
Figs. 445 – 453. – 445: *Adonea splendens* ♂, 446: *Gandanameno spenceri* ♀ (holotype of *Eresus depressus*), 447: *Dresserus schreineri*, leg, 448: *Seothyra schreineri*, chelicera, 449: *Adonea splendens*, chelicera, 450: *Magunia tentoricola*, spinnerets and anal tubercle, 451: *Seothyra schreineri*, spinnerets in dorsal view, 452: *Penestomus planus*, carapace, 453: *Dresserus schreineri*, spinnerets and anal tubercle. – Orig.



Figs. 422 - 444. - 422: *Goeldia patellaris* (holotype of *Aymarella munda*), carapace, 423: *Titanoeca quadriguttata*, lateral view, 424: *Titanoeca quadriguttata*, cribellum and spinnerets, 425: *Pandava laminata*, ♂ palpal tibia, 426: *Pandava laminata* ♂-p, 427: *Titanoeca flavicoma* ♂-p (from Finnish Lapland), 428: *Titanoeca quadriguttata*, maxillae, labium, and sternum, 429: *Titanoeca quadriguttata*, chelicera, 430: *Nurscia albosignata* ♂-p (bulbus and tibial apophysis), 431: *Nurscia albosignata* ♂-p, 432: *Titanoeca flavicoma* ♂-p (holotype of *T. ruficeps* from North Africa), 433: *Nurscia albosignata* ♀-e, 434: *Titanoeca monticola* ♀-e, 435: *Titanoeca flavicoma*, first leg of ♂ (from Finnish Lapland), 436: *Titanoeca quadriguttata* ♀-e, 437: *Titanoeca quadriguttata*, vulva, 438: *Goeldia funesta* (syntype of *Temecula mexicana*) ♂-p, 439: *Goeldia patellaris*, vulva, 440: *Pandava laminata* ♀-e, 441: *Anuvinda escheri*, ♀-e and vulva, 442: *Goeldia patellaris* ♀-e, 443: *Aebutina binotata* ♀-e, 444: *Aebutina binotata*, dorsal view. - Orig.



Figs. 465 – 476. – 465: *Dresserus schultzei* ♂-p, 466: *Dresserus schultzei* ♀-e, 467: *Eresus niger* ♂-p, 468: *Dorceus* sp. ♂-p, 469: *Penestomus planus* ♀-e, 470: *Wajane armata*, ♂-p, lateral view, 471: *Wajane armata* ♂-p, ventral view, 472: *Fecenia cylindrata*, carapace, 473: *Fecenia cylindrata* ♂-p, 474: *Psechrus sinensis* ♂-p, 475: *Psechrus argentatus* ♂-p, 476: *Psechrus torvus* ♀-e.
– Orig.



Figs. 454 - 464. - 454: *Stegodyphus mimosarum* ♂-p, 455: «*Stegodyphus*» *pacificus* ♂-p, 456: *Magunia dumicola* ♂-p, 457: *Adonea variegata* ♂-p, 458: *Seothyra schreineri* ♂-p, 459: *Adonea variegata* ♀-e, 460: *Magunia lentorilicola* ♀-e, 461: *Gandanameno spenceri* ♀-e (holotype of *Eresus depressus*), 462: *Seothyra schreineri* ♀-e, 463: *Gandanameno spenceri* ♂-p (allotype of *Eresus depressus*), 464: *Dorceus eburneus* ♂-p. - Orig.

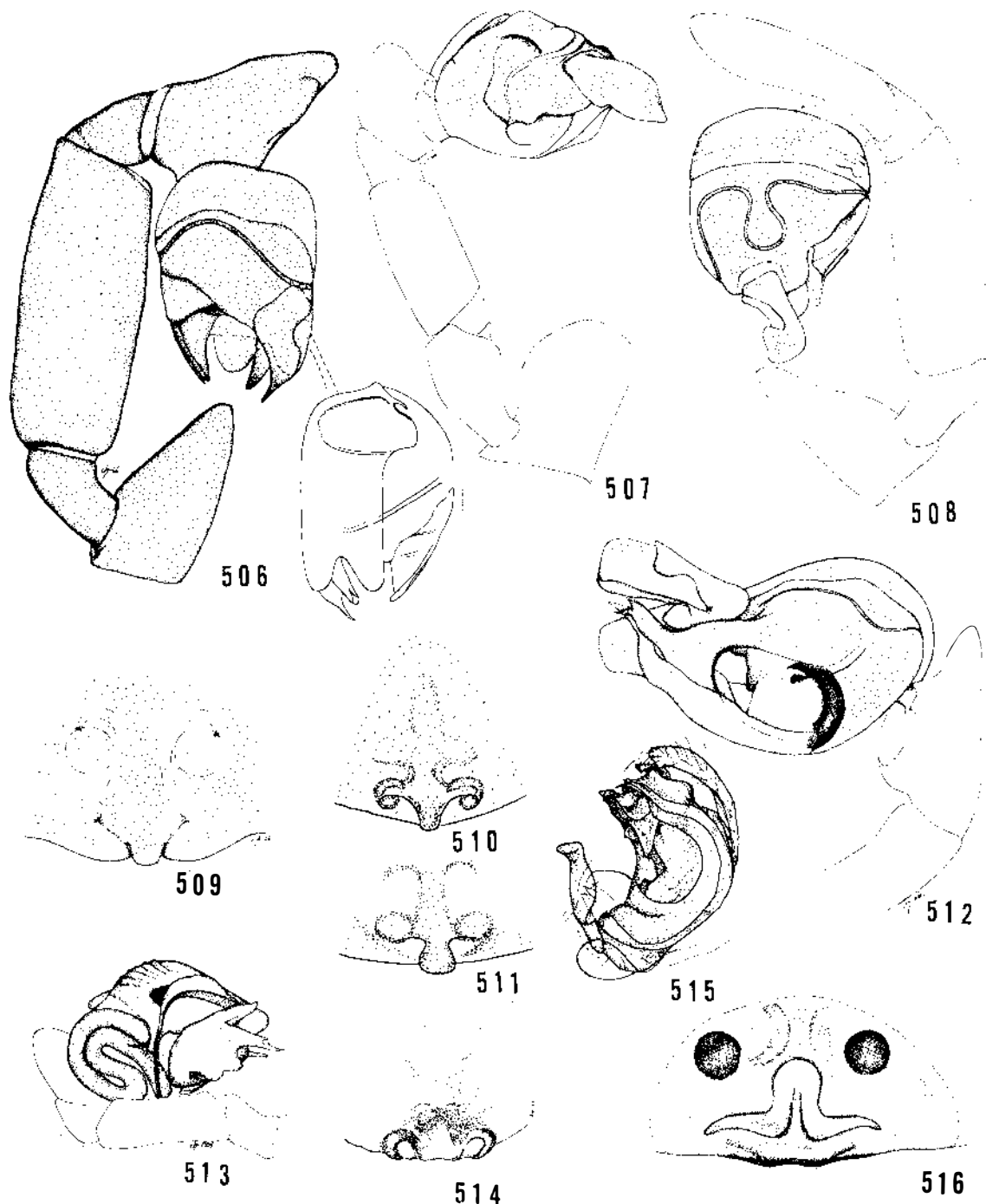
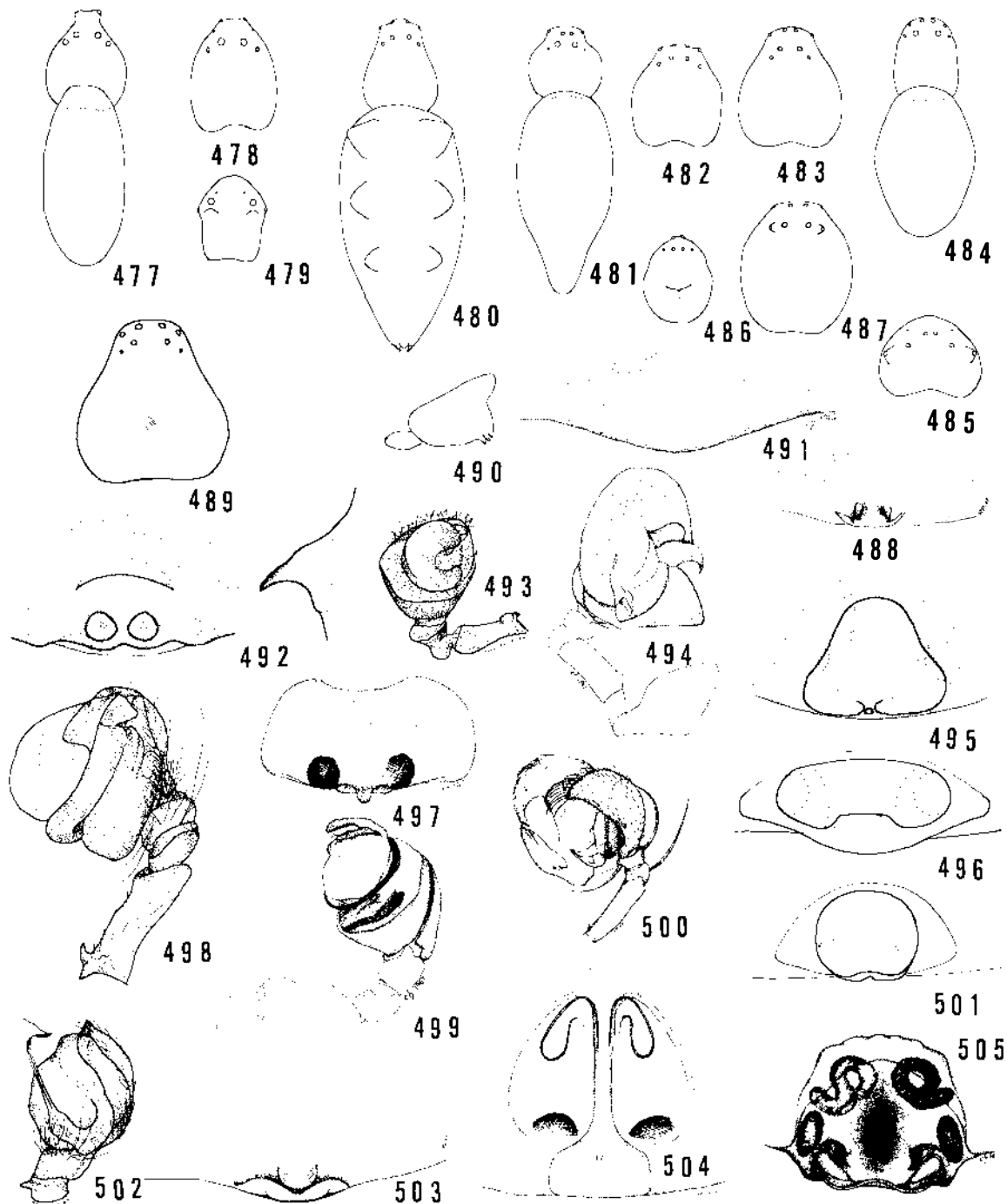


Fig. 506 – 515. – 506: *Miagrammopes thwaitesii* ♂-p, 507: *Huanacauria bambusicola* ♂-p, 508: *Ranguma similis* ♂-p, 509: *Mumaia constricta* ♀-e, 510: *Ranguma singaporensis* ♀-e, 511: *Ranguma albomaculata* ♀-e (holotype of *Miagrammopes biroii*), 512: *Mumaia corticea* ♂-p, 513: *Sybota abdominalis* ♂-p, 514: *Sybota abdominalis* ♀-e, 515: *Hyptiotes paradoxus* ♂-p, 516: *Hyptiotes paradoxus* ♀-e. – Orig.



Figs. 477 - 505. - 477: *Tangaroa tahitiensis* ♂, 478: *Tangaroa tahitiensis* ♀, carapace, 479: *Huanacauria bambusicola* ♂, carapace, 480: *Astavakra sezmucronata* ♀, 481: *Polonecia producta* ♀, 482: *Zosis sinensis* ♀, carapace, 483: *Uloborus walckenaerius* ♀, carapace, 484: *Philoponella republicana* ♂, carapace, 485: *Philoponella republicana* ♀, carapace, 486: *Philoponella republicana* ♀, carapace, 487: *Philoponella republicana* ♀, carapace, 488: *Zosis sinensis* ♀-e, 489: *Ariston albicans* ♀, carapace, 490: *Polonecia producta* ♀, lateral view, 491: *Polonecia producta* ♀-e, 492: *Ariston albicans* ♀-e, 493: *Zosis geniculatus* ♂-p, 494: *Zosis geniculatus* ♂-p, 495: *Philoponella tristic* ♀-e, 496: *Philoponella undulata* ♀-e, 497: *Astavakra sezmucronata* ♀-e, 498: *Philoponella republicana* ♂-p, ectal view, 499: *Zosis sinensis* ♂-p, 500: *Philoponella republicana* ♂-p, lateral view, 501: *Philoponella mollis*, 502: *Tangaroa tahitiensis* ♂-p, 503: *Polonecia producta* ♀-e, 504: *Daramulunia gibbosa* ♀-e, 505: *Philoponella pantherina* ♀-e. - Orig.

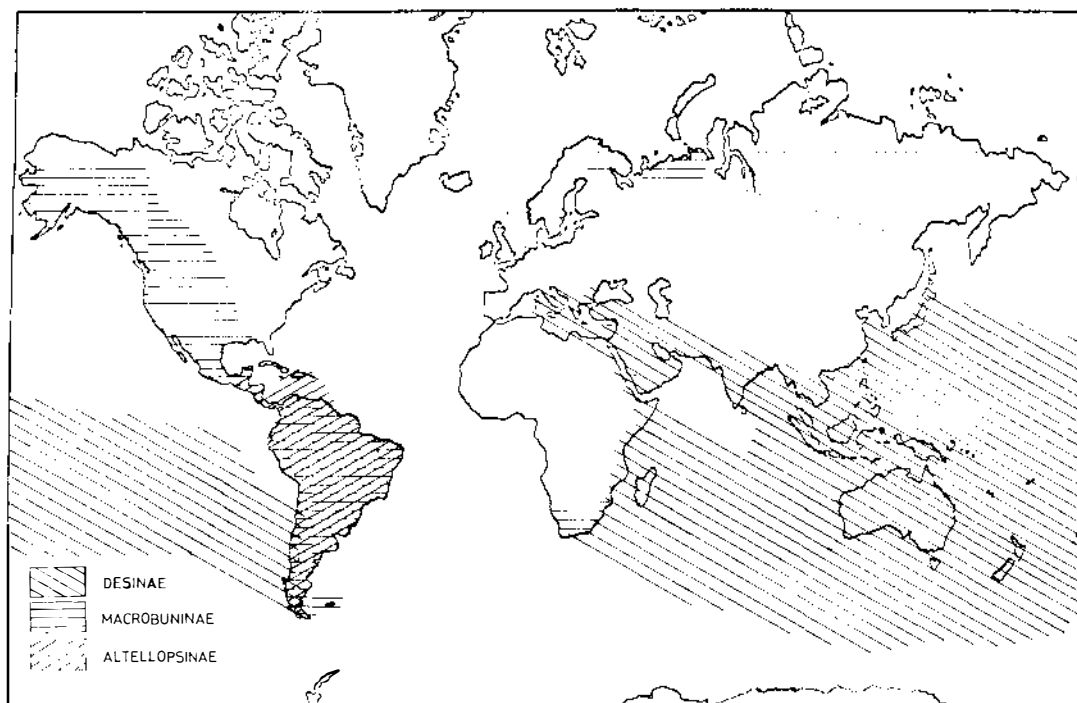


Fig. 519. Range of some Amaurobid subfamilies.

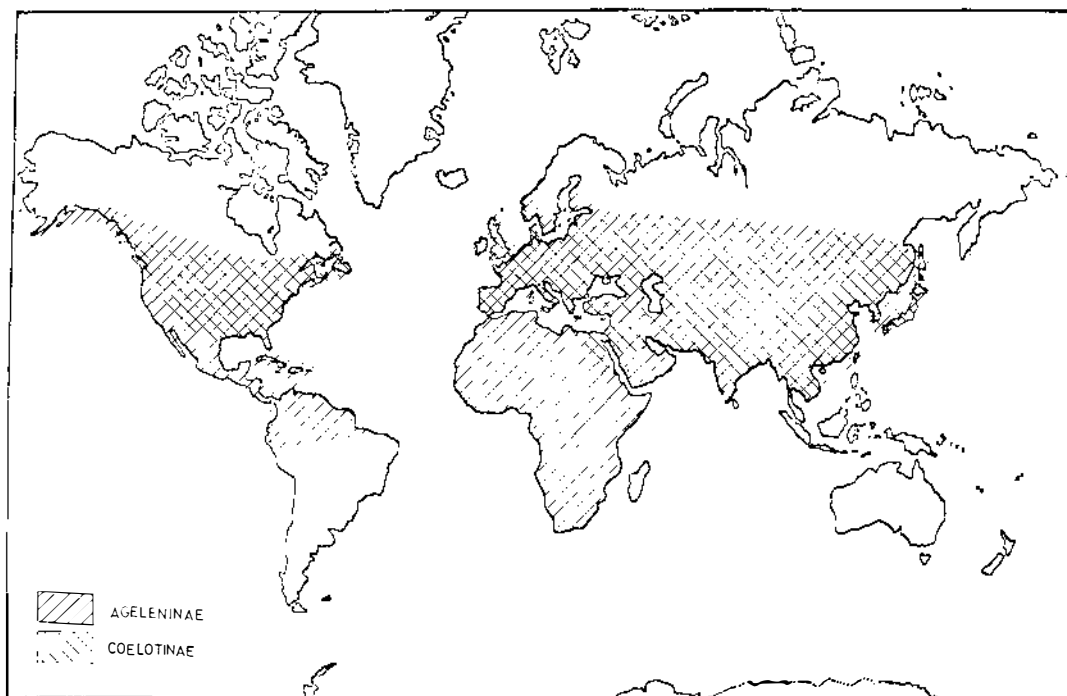


Fig. 520. Range of Agelenidae.

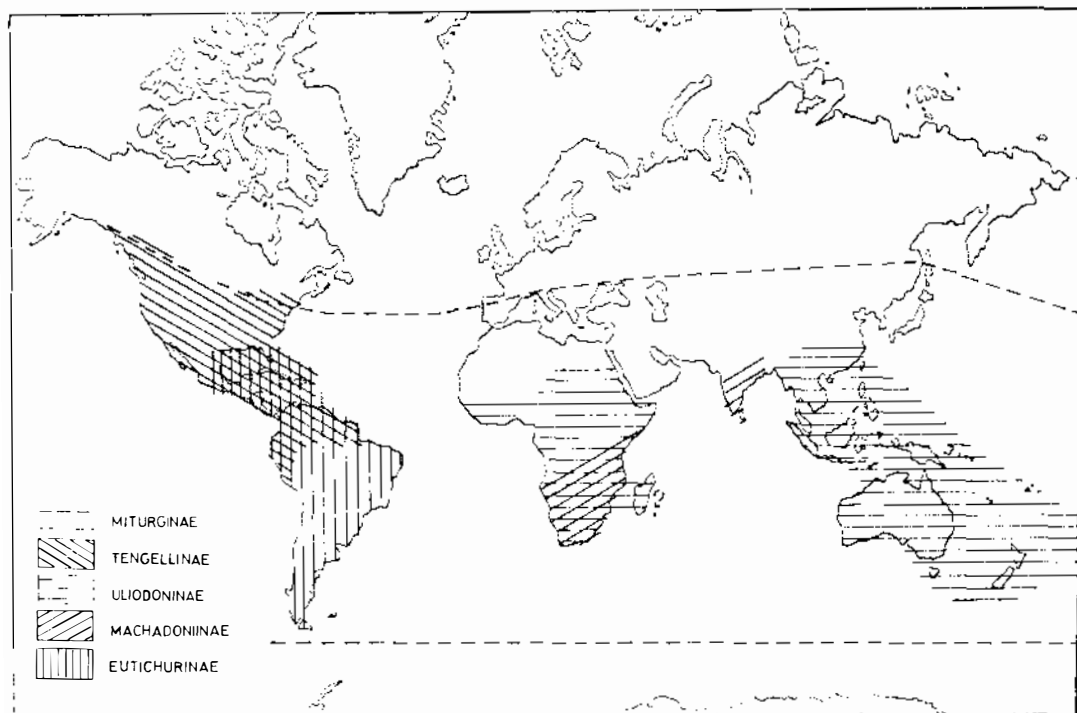


Fig. 517. Range of Miturgidae.

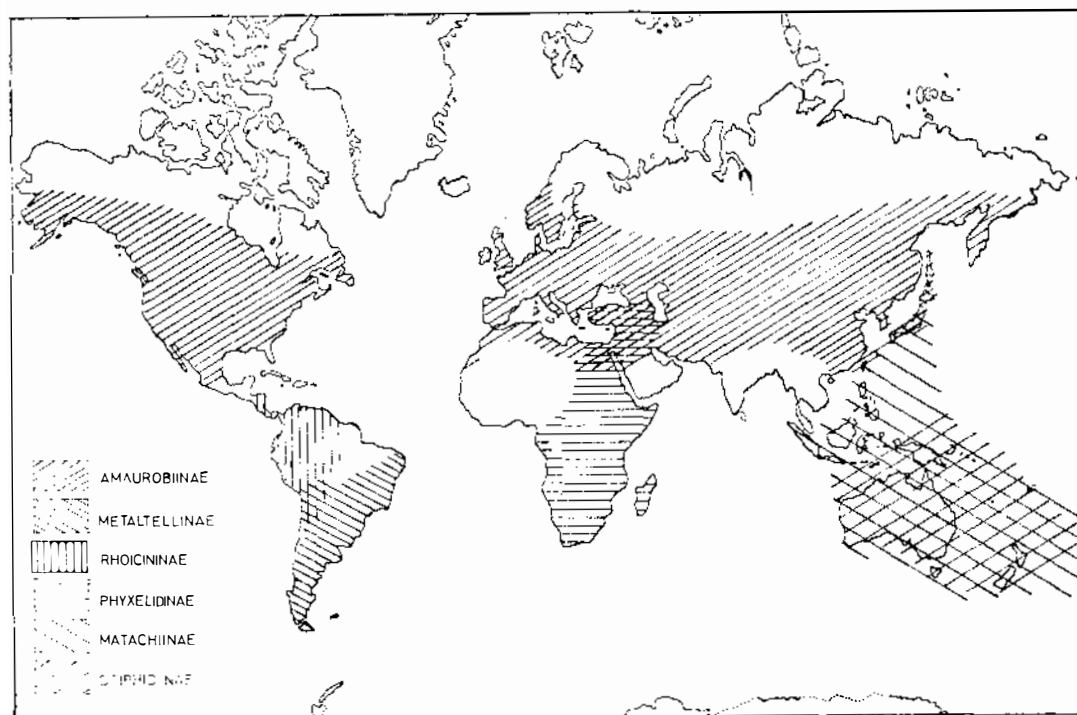


Fig. 518. Range of some Amaurobidae subfamilies.

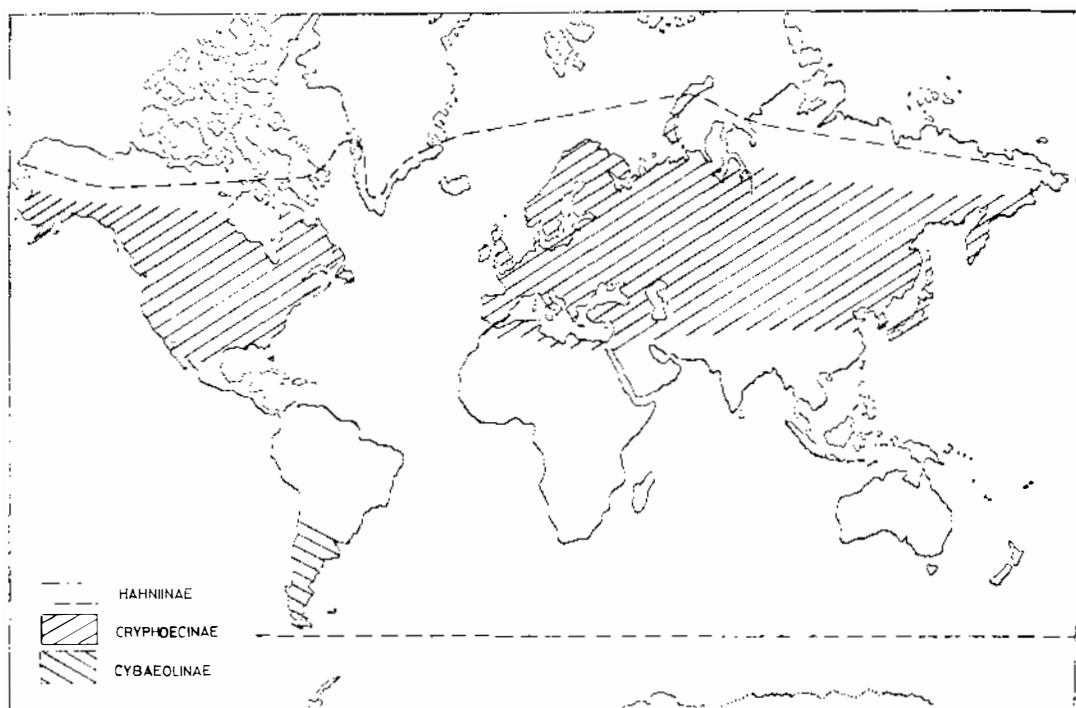


Fig. 523. Range of Hahniidae.

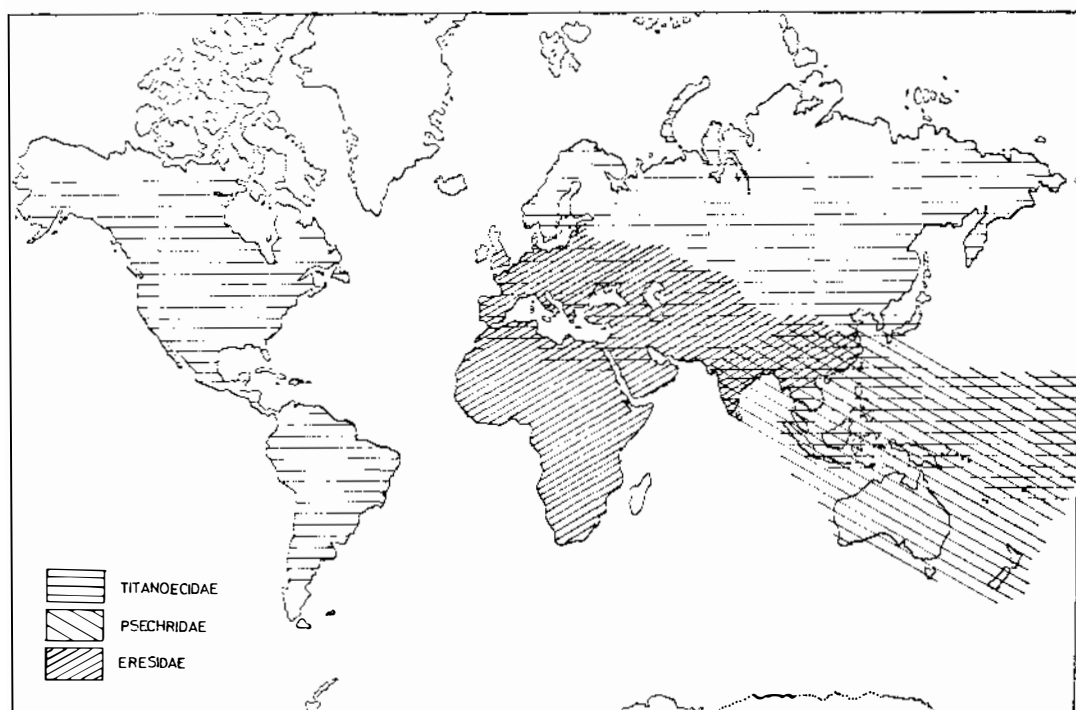


Fig. 524. Range of some Cribellate families.

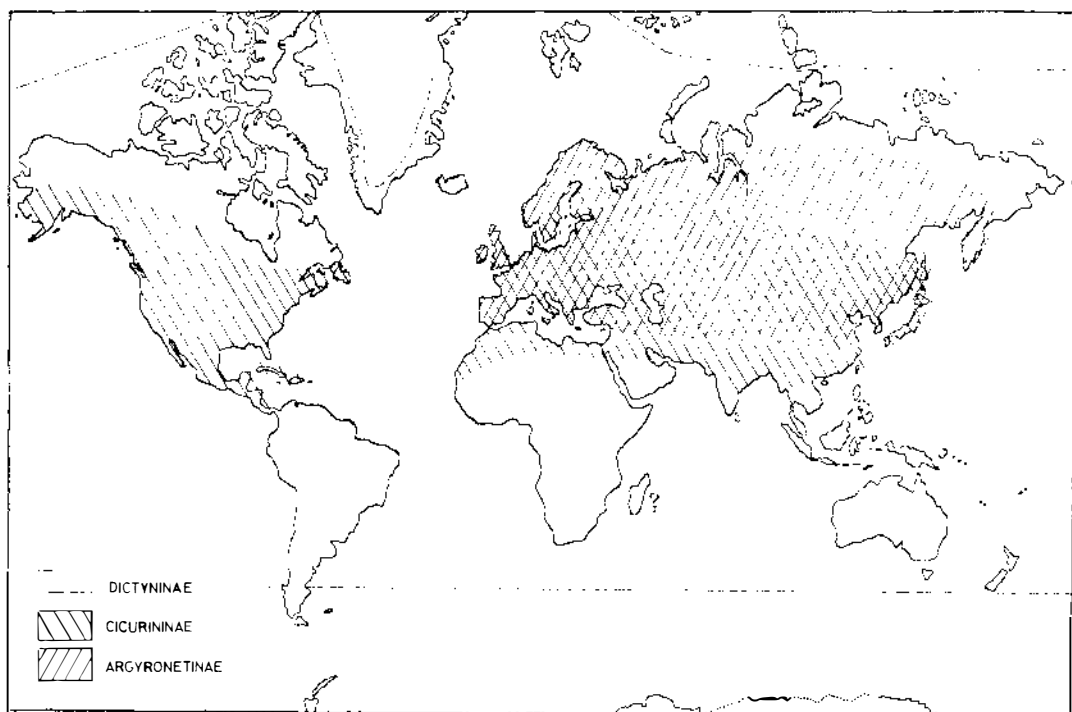


Fig. 521. Range of some Dictynid subfamilies.

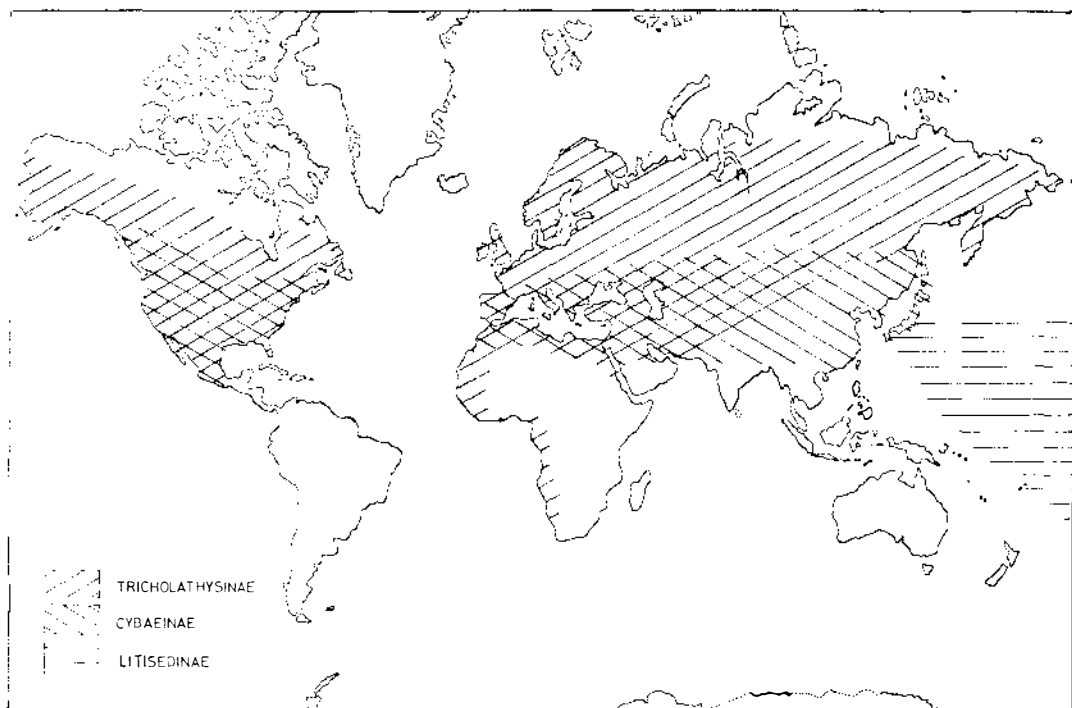


Fig. 522. Range of some Dictynid subfamilies.